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NEWS IN BRIEF

£500,000 TSB contract

SOFTWARE house Data Logic, acquired by Raytheon Cossor Data Systems at the beginning of the year, has landed a £500,000 software contract from the Trustee Savings Banks Trust Company in Andovers, Hants.

The contract is for a terminal-driven database system to run on TSB Trust Company's Burroughs B3800 mainframe. It will support between 20 and 50 terminals and take four years to implement.

New mini range

A COMPLETE new range of 32-bit minicomputer systems is being launched by Perkin-Elmer Data Systems in September, to effectively rationalise the products from the various companies that PEDS has acquired. The processors will come from PEDS Interdata subsidiary, with discs from Wangco, and VDUs and printers from the Terminals Division.

X25 for Telenet

The value added common carrier, Telenet, has become the first US network to support the CCITT approved X25 protocol that interfaces customer terminal equipment to a public packet switched network. Telenet customers in more than 20 US cities can now use X25.

H-P terminal

MOVING into the intelligent graphics terminal market, Hewlett-Packard has introduced the HP 2647A which can be programmed in Basic and can display data as graphs, pie or bar charts. The HP 2647A can also display full alphanumeric data and costs £5,600.

Matthew at Membrain

A BUDDING electronics engineer aged 15, winner of the Design Council's "Designers for Tomorrow" competition, was invited to see Membrain's factory in Dorset, because of his interest in automatic test equipment.

Matthew Tonks, from Chelmsford, won the award last November for an integrated circuit tester he designed and built himself to help him choose working components from manufacturers' reject stock.

At Membrain Mathew saw designing and manufacturing processes and the company's specialists were interested to learn that Matthew had developed for himself some of Membrain's techniques.

Our picture shows Ian Dow, Membrain's product marketing manager, explaining to Matthew Tonk, the workings of a printed circuit board.

Hong Kong all set to get viewdata service

ONE of the first countries after the UK to begin operating a viewdata service is now likely to be Hong Kong, if negotiations between the Hong Kong Telephone Co and the British Post Office are concluded successfully.

Roy Bright, the PO's international viewdata marketing manager said a pilot trial was the next logical step to be taken, and although no formal commitment had been made, "we are talking in terms of months rather than years."

A report in Computer Monthly, an official publication of the Hong Kong Computer Society, says that the company purchased a terminal from the British Post Office last February to explore the capabilities of the system and is now planning to have a service operational by the end of this year. Demonstrations have been enthusiastically received.

They were carried out by linking the terminal via a Cable and Wireless circuit, to the Post Office viewdata computers at Martlesham Heath, Suffolk.

The Hong Kong Telephone Co has now requested detailed costings of the service from the Post Office, and has plans to have a full viewdata service running by the end of 1979. It believes, however, that the service will primarily be used as a business system, at least until the transmission of Chinese characters is perfected.

During the trial period, between 20 and 30 editing terminals will be made available to information providers, several of which have already indicated a wish to take part.

One possible fly in the ointment against getting a viewdata network into service in Hong Kong is its telecommunications laws about which there has been disputes for several years.

Switched data services do not come within the Telephone or Telecommunications Ordinances, but it is understood that the telephone company has applied for a licence for viewdata under the Telecommunications Ordinance, which the Hong Kong Post Office is believed to have wanted them to do, rather than getting the Telephone Ordinance amended, which is what the company wanted.

Plea to Fleet St

A WARNING by Albert Booth, Secretary of State for Employment, on the dangers that both newspaper managements and unions face if they do not accept the new computer-based technology in Fleet Street, appears to have been met with general if sometimes qualified agreement.

Speaking in the Commons last week, Booth said that the problem of industrial relations in the newspaper industry were critical.

Agreeing with the minister, William Rees-Mogg, editor of The Times, told Computer Weekly: "Clearly, it is true that the future development of the industry depends on computer technology."

A more cautious response came from the Financial Times, where a spokesman said that they should not look for immediate returns, but that in the long-term, the new technology would provide a number of savings.

$150m bid for Data 100

AMERICAN aerospace giant McDonnell Douglas has agreed in principle to buy Minneapolis-based remote batch terminals specialist Data 100 Corp for $150 million. Northern Telecom of Canada, which holds 31% of Data 100, was expected to fight McDonnell Douglas for control of the company but is now understood to have accepted the deal. The bid is worth either $17.50 in cash for each Data 100 share, or paper convertible at some future date into McDonnell Douglas shares which the company says will be worth about $20.06 a share.

McDonnell Douglas has several interests in specialised digital applications including process control, digital telephone equipment and medical instruments, but Data 100 would take it into the mainstream computer market for the first time.

Union plans DP staff policy

THE difficulty of reconciling the requirements of DP staff with other union members and a desire to abolish "non-essential" night shift working were highlighted in a motion carried at the annual conference of the Society of Civil and Public Servants at Bournemouth.

In a motion carried by the conference, it was recommended that the SCPS executive should prepare a document defining the job descriptions and grading structures of DP personnel within the Civil Service. This would be a first step in developing a "rational policy acceptable to all members" to overcome the sometimes disparate interests between DP staff and the rest of the union.

The Post Office group of the SCPS carried a motion calling for the abolition of non-essential night shift working.

ICL ready with 3030 challenge

ENHANCEMENTS announced last week to the processing power of large ICL 2900 systems enables the 2980 to perform calculations at the same speed as the IBM 370/168, and ICL's challenge to the IBM 3030 series is expected shortly.

The 3030 challenger is likely to include replacements for the 2970 and 2960 incorporating improved I/O handling and processor power (CW, May 18).

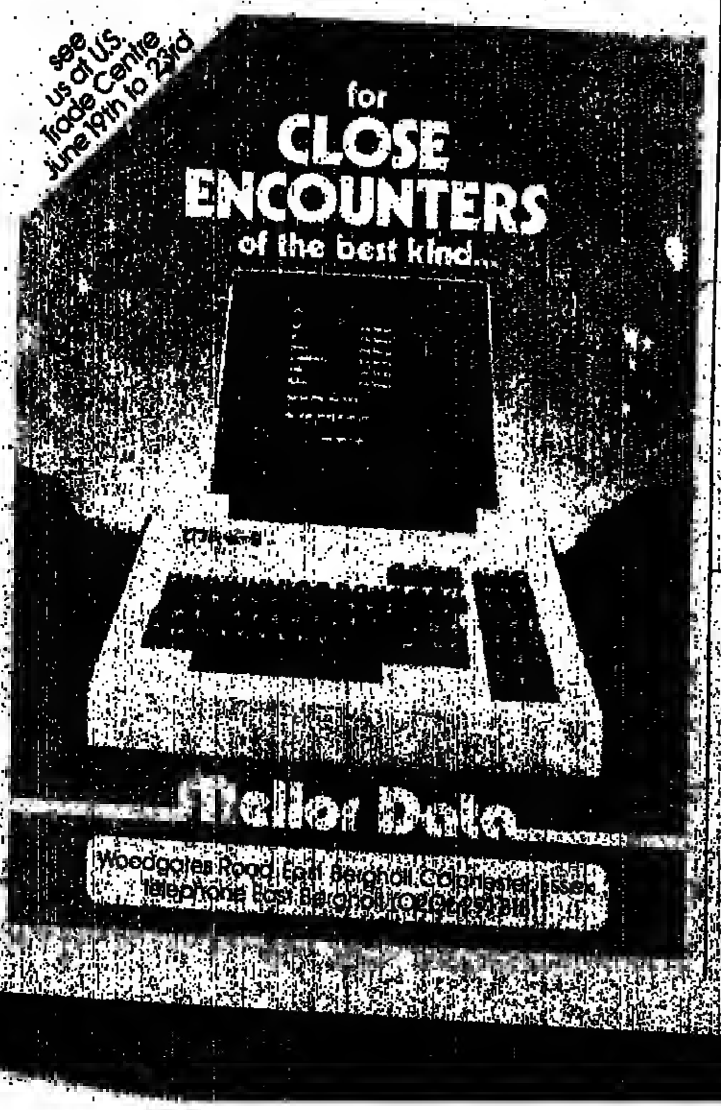
The announced improvements to the 2976 and 2980 are mainly of interest to scientific users, such as the UK Atomic Energy Authority which is already using the enhancements on a 2980 at Risley (see page 2).

The time taken to perform calculations on the 2976 and 2980 is claimed to be cut by two thirds by using the enhancements, a Fast Multiply/Divide unit and the Micro-coded Maths Library.

More cash fo school projec

A THREE-YEAR extension costing £67,200, has been granted to the Schools Council project "Computers in the Curriculum," which develops and publishes educational material on computing.

Miss Margaret Jackson, under-secretary for Education and Science, told the House of Commons that £48,900 had been spent on the project from 1973 to 1977. Trials had been conducted in 130 schools, she said.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Briefing

Red China's first 370

THE first order from Red China for a 370 system has been announced by IBM. Understood to be a 370/138, the machine is to be installed at an engineering works making turbo-fans and air compressors at Shen Yang in the north east of the country. Cocom approval is being sought for the deal but delivery dates and where the machine will come from have not yet been decided.

Earlier this year Hitachi won approval for the export to China of an M-170 and two M-160II mainframes for weather forecasting (CW, February 23).

Honeywell display

ALONG with its two new Level 6 minis (page 15), Honeywell has announced an intelligent display terminal, the VIP 7801, which is built around the Motorola 6800 microprocessor and costs $2,885. Honeywell's Incoterm subsidiary has launched a range of data collection terminals, the Series 3000, which feature 18 or 36 character strip displays and optional magnetic stripe readers. No prices have been quoted.

Univac, Czech deal

COMMERCIAL computer systems from Univac will be among the equipment covered by a scientific and technical co-operation agreement that has been signed between the Czechoslovakian Ministry of Technical Development and Investment and Sperry World Trade. Detailed discussions are to start immediately in Prague.

Banks and benefits

EXTENSIVE talks have taken place between the London clearing banks and the Department of Health and Social Security on the feasibility of paying benefits by automatic credit transfer through the Bankers Automated Clearing Service, although no conclusion has yet been reached. More on automated banking, page two.

Scanner for UAE

AN EMI general-purpose CT5005 Series 2 body scanner is to be installed at the Rashid Hospital, Dubai, later this year, making it the first computer tomography scanner delivered to the United Arab Emirates. It will help the hospital with its specialist research into eye diseases.

US 2903 order

THE first US order for an ICL 2903 from outside the New York area has been placed by the Federation of American Societies for Experimental Biology in Washington DC. With a 32K processor, two EDS 60 discs, and a line printer, the machine will be used initially to handle membership, subscription and mailing lists. The federation plans later to use it for indexing of bibliographic information, and accounting and reporting.

Taking a ride on the DIY hobby-horse

THE growth in hobby computing is already rapid, but many potential purchasers have been deterred by the prospect of building a system from a kit of parts. Some have gone ahead and bought a kit, only to come across the problems afterwards.

To help hobbyists facing these problems, Computer Weekly is to start an occasional series of articles, taking readers through the stages of kit building, highlighting the problems and methods of overcoming them.

The advent of microcomputing offers greater scope for developing a small systems for use in business and industry — a trend which has brought a necessary change in outlook in software and systems planning requirements. Our work in kit building will also be extended into kit using the planning of systems and the writing of the software.

The first kit to be built is an Introkit from National Semiconductor. Based on a SC/MP microprocessor, it is probably the minimum configuration of hardware that can be called a computer. Also from National there is the Low-Cost Development System with 2K bytes of RAM, and National's 4K byte Industrial Basic. This will be used to develop systems and software projects.

To power the two microsystems, we will be using Gresham Lion power supplies. Such power units are essential to ensure the right voltage and current. Once the systems are ready for operation, data input and output will be by a Datawriter 3330 from ITT Creed.

● In our picture Martin Banks (left) and Donald Kennett discuss the LCDS assembly.

UK venture bids for mass market

THE British government's National Enterprise Board is planning to move into the manufacturing of advanced semiconductor memories for world markets with the establishment of a multi-million pound investment plan to set up a British company making 64K bit random access memories.

The government also has plans to support the existing microelectronics industry through the National Economic Development Office (CW, December 1, 1977). This plan is to exploit the industry's capabilities in special circuits and will not be affected by the NEB move, which is an attempt to tackle the market for standard products.

The NEB plan, which was approved by the Cabinet last Thursday, is to back a group of engineers currently working in California's Silicon Valley. It is believed that between £20 to £30 million will be required for the venture, some of which will be supplied by members of the group. The group does not consist entirely of British nationals.

As the NEB has special employment responsibilities for the north it is keen to see the new company establish its base in that area, but a spokesman for the NEB said that the final choice of location had yet to be negotiated. He did confirm that it is estimated that about 4,000 new jobs could be created in a three to four year period.

There was no official confirmation of the product that the new company will be making, but it is clear that it will be a semiconductor memory larger than current 16K bit devices, most probably a 64K unit. The Japanese company Fujitsu has already announced a 64K device but many industry observers regard it as an uneconomic system which is more an engineering exercise than a real commercial attack on this market.

Several US companies, such as Intel, have talked of making 64K bit samples available towards the end of this year but it is unlikely they will be in a position to mass produce such devices for one or two years by which time the new British company could be established. A formal announcement of the venture is expected within three months.

IBM picks Motorola

IT NOW seems almost certain that IBM has selected Motorola as a major supplier of microprocessors for peripheral and terminal equipment, following evaluation of the Motorola 6800 and Intel 8080 devices (CW, March 30).

Neither company would confirm the deal but such a move would be in line with IBM's known interest in the application of microprocessor technology. The company is studying the development of personal computing (CW, March 16), and is also considering getting involved with over-the-counter sales of small computer systems (CW, March 23).

For Motorola the tie up with IBM, which is expected to cover the 6800, 6802 and 6809 microprocessors, follows two big orders from US car giants Ford and General Motors. Both are using Motorola devices in the first stages of a major programme to use advanced electronics in mass market cars (CW, September 8, 1977).

Industry sources report that IBM will initially place a small order for 6800 family devices, and this will be followed by volume orders for delivery during 1979.

ICL in South Africa

IN response to a request from Trade Secretary Edmund Dell for British firms operating in South Africa to provide adequate employment provisions for black South Africans, ICL has said that its policy is to have equal opportunities for equally qualified people, although it could not yet comment on the government's detailed code of conduct.

ICL has invested £180,000 in the training of non-Europeans in South Africa (CW, May 18), where the company hopes to do record business this year. Hardware sales of £22 million in the first seven months of the financial year are over double last year. More on computing in South Africa, page 21.

SPECIAL US INTERNATIONAL ISSUE

To coincide with the National Computing Conference in Anaheim, the International Section in this issue concentrates on the US scene. There is Washington Report by Becky Barna (page 16); Letter from the US by Hesh Wiener (page 17); an interview with Charles Lecht, president of Advanced Computer Techniques (page 20) and a roundup of news (page 15). On page 22 Tim Palmer reports from India and Keith Jones reports from Czechoslovakia (page 23). And the rest of the news and views of the computer scene are covered by Computer Weekly's regular features which include:

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Prestel trial problems

THE full trial system of the Post Office's Prestel service is going to be delayed by at least six weeks because of software problems.

The first 50 users were due to be linked to the first GEC 4080 in London this week and they will be getting access to pages of information free because software to allocate the charges between the Post Office and the information suppliers is not ready. The users will be paying only standard line charges. The Post Office is looking on the "free time" as a promotional ploy for the service. It would not comment on the charging problems but admitted that a shortage of programming staff and a lack of training had been partly responsible for the delay.

Prior to the London centre in Gresham Street coming online, the Prestel trial is running of a system at Martlesham Heath, Suffolk, research centre. This has only 16 communications ports and even the information providers are having difficulty accessing it to edit pages. The Gresham Street computer has 64 ports, which should ease the access problem when it becomes available.

● Prestel in the US — Page 18

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Typist's dream or nightmare?

VISITORS to the Word Processing Exhibition in London next week (page 11), will be faced with a bewildering array of competing products. Some 30 makes of machines will be on show, and even this is small when compared to over 50 which were on display at Hanover Fair in April.

This proliferation, to a large extent is due to the way new technology has made it remarkably easy for anyone to set up shop in this business. Anyone with his own pet ideas on user interfaces and a garden shed can buy his hardware OEM, write some software, and he is in business. And looking at some of the products, it shows.

All these entrepreneurs, big and small, are waiting eagerly to reap the rich harvests of the word processing revolution, which, we are told, is just around the corner. It has been just around the corner for years, and meanwhile more and more firms enter the market, cutting each other's throats in competing for the business of the big organisations, which are being distinctly cautious about committing themselves to an expensive and far reaching change in the way they run their operations.

One thing is certain, that the revolution will come — eventually. It makes no more sense to keep on manufacturing mechanical and electromechanical typewriters in this day and age than it would to continue making mechanical calculators and cash registers. Information is best handled by electrons, not levers. And, as has happened with calculators, the large number of firms in the business will doubtless be whittled down drastically by competition.

What is of vital concern to the users is that it will be the firms with the best products that will survive, or else we will be stuck with systems that are frustrating, difficult to use, and fall far short of the enormous potential of automatic text handling.

It is by no means inevitable that the best products will win out, as can be seen by the current sales of machines that have little to recommend them apart from an elegant housing and a glossy brochure. Ignorance about the real needs of typists, and the important and less important factors in WP, are rife.

Users, therefore, have a heavy responsibility: to educate themselves thoroughly in the facts of WP, however complex and confusing the field may be, so that they can separate the truth from the fiction in all the arguments.

When you buy a machine with this bell rather than that whistle, make sure, as some of the pioneering purchasers have failed to do, that you actually need the bell and not the whistle. Only this way can we avoid the dream of the electronic office of the Future turning into a nightmare.

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FOCUS

The user must call the tune

THE British National Computing Centre is currently investigating the efficiency of "typical" DP installations. This particular exercise could well be doomed before it starts. No DPM would admit that his operation was in any way typical.

The well known diligence of the NCC to standardise all DP activities, appears to have made little dramatic impact on the individual, or standard, installation. Just about the only common factor in DP is the equipment, and now even that ranges from major to minor.

The tune which most DPMs respond to is that of their company. As a result, not only are no two installations alike, but relative workloads, applications and operations have little in common. Likewise the DPM. Should any attempt be made to produce an "Identikit" picture of a DP manager, it would be an abortive task. Apart from a standard worried look, DPMs come, like their installations, in assorted sizes, shapes and skills. The well known "Jack of all trades" would have much in common with the "typical" DP manager.

Topics such as "Computing policy in the UK" at the Eurocomp 78 Conference (CW, May 18) may well fascinate the presenters — it has but little relevance to the DP man in the installation who is probably more concerned with the computer policy, if any, of his own company.

Likewise, Eurocomp session "Computer systems in the year 2000" got relegated in terms of installation interest, when getting next week's payroll tax amendments updated or interfacing a new plug compatible add-on memory with an existing CPU, which in no way intends to be compatible, is of prime importance.

In fact, most DP personnel have yet to be convinced of the well publicised "miracle of the chip" or the "mini/micro revolution". They are too busy having close encounters with reluctant line printers, tape drives and data prep operators of the old kind.

Unfortunately perhaps for the industry establishment, the advice of the company managing director carries more weight than any gathered assembly of computer notaries. According to many such sages, the industry is leading directly to the cliff edge. Meanwhile, the company accountant will be heading down a one-way path to the computer installation if, results failed to come on time.

Unlike certain professions such as Medicine, Law and Accountancy, where those involved have a responsibility and duty to their calling, sometimes over that of their employers, the DP men has to call for his daily bread the hard way. His horizon is bounded on all sides by his company, or maybe his prospective employers. He either toes the company line or takes steps to face the consequences.

It is, therefore, hardly surprising that most professional DP managers have little time or enthusiasm for playing a wider role in the DP industry. Any spare resources in terms of time and energy can only be devoted to attending conferences and seminars and any benefits thus obtained must be shared by the company as a whole.

The best advice for any new arrival to the installation is the sooner he can forget his previous working habits, the better.

Learning the company rules is far more important in survival terms than keeping abreast with the latest standard communique from the NCC, the Computing Services Association or the Data Processing Management Association.

Ten years ago...

COMPUTER WEEKLY MAY 30, 1968

AN optical memory with a capacity of 65,000 68-bit words was unveiled at ICT's Stevenage R&D centre . . . The first standard peripheral interface in the world, developed by the NPL and computer manufacturers, was to be submitted to the ISO in Paris for adoption on an international level . . . At its first annual meeting, the DPMA stressed the need for "dynamic activity" . . . Alitalia's London office was connected to the Rome reservation and control system, Arco, composed of three IBM 360/65s . . . ICT profits for the first half of the year showed a rise of 84% and dividend was up from 1s 10d to 2s a share . . . CDC entered the disc market with its 851 and 848 third generation compatible disc packs . . . The first NCR Century 200 order in the UK was placed by Sussex Data Systems.

INTERRUPT

THIS week we have a story to tie in with two themes in this issue — America and word processing.

During the traumatic Vietnam war, a US Congressman decided to write to all non-aligned countries asking them to do something about the difficult position of American prisoners of war in Vietnam.

Being an up-to-date administrator, the Congressman used a word processor, which enabled his secretary merely to insert the relevant name and address at required places in the standard letter.

Unfortunately, due to some strange bug, the letters were being produced with the correct first and last paragraphs but gobbledegook in between. After a brief and obviously inadequate check, the busy Congressman duly signed all the letters.

At least one was intercepted at the US Embassy which was about to deliver it to the President of that country. The Ambassador returned the letter to the Congressman with a note saying, "Sir, I do not really think you wish me to deliver this letter." The fate of other letters is unknown.

And the moral of this story is one of the oldest in the DP world — always check your output for garbage, as well as your input.

● The £5 Interrupt prize this week goes to Peter Williams of London.

Over-optimistic predictions of cashless society

PREDICTIONS that the increased use of electronic funds transfer would soon lead to the "cashless and chequeless" society have shown an "unrealistic optimism about the pace of change," according to a report* by the Committee of the London Clearing Banks.

In the report, which is the banks' evidence to the Committee on the Functioning of Financial Institutions, chaired by former Prime Minister Sir Harold Wilson, the committee commented, "At least 95% of all payments, dealt with by the banks, are still made in cash and 65% of the remainder are made by cheque."

It claims that cash and cheques have "unique properties" which make them "far more flexible than most rival methods of payment."

The report concludes, "Cash and cheques have existed for centuries and there is no reason to suppose they will be rapidly replaced. Therefore, the clearing banks expect to devote as much attention to improving existing services as to developing entirely new ones."

However, the report points to the Bankers Automated Clearing Service as an example of an electronic payment service which is growing rapidly.

And despite its warning about "over-optimistic forecasts," the report says that "a more fundamental change in payments methods may well be the introduction of electronic fund transfer from the point of sale although it emphasises that banks believe that "it is unlikely that such methods will be in common use before the 1990s."

Bacs, originally based on ICL 1900 systems which are being replaced by ICL 2960, enables inter-bank payments to be made through the electronic transfer of data, mainly on magnetic tape, eliminating the exchange of paper vouchers.

This system has grown at a rate of over 14% since its inception in 1972 and the report points out that over 70% of all salary payments credited to bank accounts are now made through Bacs, which is now the world's largest automated clearing house.

Another existing automated service highlighted by the report is the electronic switching system, Chaps, the Clearing House Automated Payments System which improves the cheque clearing methods by enabling clearing and non-clearing banks to initiate large value payments automatically. A similar system called Chips, is being developed in the US (see page 15).

The London clearing banks are Barclays, Coutts, Lloyds, Midland, National Westminster and Williams and Glyn's.

*The London Clearing Banks, Longmans, 278pp, £4.95 (soft cover £9.95 (cased).

A NEW mini-based system for data acquisition and process control has been introduced by Base Ten Systems of Aldershot. Called Magic, it is made up of a range of modules which can be exchanged and added to for purposes of expansion, and Base Ten can provide software tailored to the customer's own requirements.

A VDU and command software allow an operator to control the system by means of a question-and-answer dialogue. Applications envisaged include manufacturing processes, test rigs, and environmental systems.

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the facts.

See page 5

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ICL profits mean 5% bonus

THE ICL half-year results have brought smiles all round at the company, with ICL employees earning a 5.5% productivity bonus for their contribution to the raising of pre-tax profits by 21% compared to the first half of the 1977 financial year.

For the six months ended March 31 this year ICL's turnover was £232.1 million, 23% more than the equivalent period last year, with pre-tax profits up from £13.0 million to £15.8 million.

The profit represents a 6.8% margin on turnover, which is 0.7% below the level that must be reached before ICL starts to repay the £400 million loan the company received from the UK government to help develop the 2900 series. But ICL chairman Tom Hudson said that he believed it was in the best national interests, as well as the best interest of the company, that ICL should invest in future growth as its main priority.

For ICL's managing director, Dr Chris Wilson, one of the most pleasing aspects of the results is that over the last four months ICL's industrial relations has improved dramatically.

Over half of ICL's turnover and profits are outside the UK.

Money borrowed to finance this export-led growth and loans to build up stocks to meet an order book that is up by a third on last year meant that ICL's interest charges for the first half year were up from £3.7 million to £5.1 million.

In the last full year, ICL made a profit of over £30.3 million. As ICL's performance in the second half of the year is traditionally better than the first half, it is expected that this year ICL will make over £35 million profit.

Some of the answer . . .

What is IBM's reaction to the growing microprocessor activity? This is one question that should be answered, at least in part, at a forthcoming meeting of the BCS microprocessor specialist group, to be held at University College, London on June 8.

Mike Davis of IBM will be joined on the platform by Phil Pitman from the microprocessor manufacturer Zilog, to discuss the latest developments in microprocessor technology. For further information, contact J. W. Carter, Wood Grove, Ashley Road, Epsom, Surrey.

GEC dispute escalates

TWO sit-ins were staged at GEC's Stoke, Coventry plant last week, as the operators' pay dispute continues. On Tuesday they occupied the contract engineers section, and on Friday took over the computer room, preventing any work taking place. A spokesman for GEC said: "We are taking the appropriate legal action."

The dispute started on February 24 because the operators are unhappy with pay rises offered by the company. It became an official ASTMS matter on March 20.

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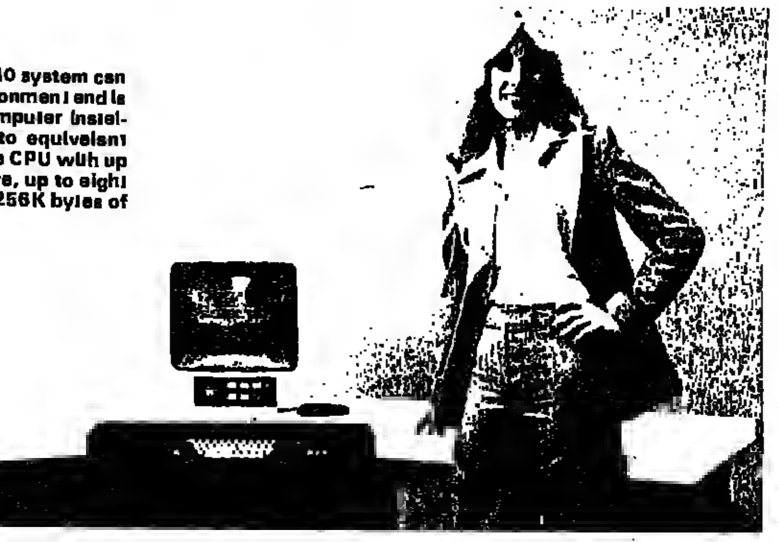

This basic Magnuson M80 system can operate in an office environment and is said to save 75% of computer installation space compared to equivalent IBM system. It contains a CPU with up to 4 Mbytes of main store, up to eight data channels and up to 256K bytes of firmware.

Desk unit challenge to big mainframes

INSIDE a desk-high unit (see left) the latest challengers on the IBM plug-compatible market, Magnuson System Corp of California, has packaged a system which not only claims to provide two to three times better performance than the middle range IBM 370s but is also said to be able to emulate Burroughs, Honeywell, Univac and other non-IBM systems.

As if this was not enough, the Magnuson M80 range, announced two weeks ago (CW, May 18), has been built within a modular design, called strategic architecture, which the company says will enable it to be organised in a variety of system configurations, including having a separate data base processor, as has been predicted for the IBM systems what will start replacing the 370 and 303X series within a few years.

The M80 can have up to 256K bytes of firmware, of which 8K are currently used for IBM compatibility.

The first two models announced by Magnuson, the M80/3 and M80/4, are said to offer between 20% and 100% improved power over the 370/138 and 148 respectively at typical prices of about $200,000 and $400,000.

The systems have been tuned to improve the performance of Cobol program, including a CPU optimised for decimal arithmetic, which is said to process Cobol programs up to twice as fast as its IBM equivalents.

The basic system can expand to up to 16 Mbytes of memory and 16 channels. The system's design also provides a capability for expanding memory to up to 4,000 Mbytes and for the use of any new technological developments such as bubble memory.

The key to the M80 series is the "structural modularity" of the design, which has a 32-bit bus linking the CPU, memory, console and data channel modules.

Magnuson expects first deliveries of M80 systems within 60 to 90 days and will announce the M80/5 later this year to challenge the IBM 3031, at a price of about $600,000.

Logica enters WP stand-alone market

SYSTEMS house Logica, already the UK's largest supplier of shared-logic word processors, is entering the stand-alone market with a new design of machine incorporating purpose-designed hardware and several novel features.

Called the VTS/100, VTS means video typing system, the unit will be launched at next week's International Word Processing Exhibition at Wembley.

VTS/100 is based on, and grew out of, Unicom, the shared-logic system Logica originally designed for Unilever, but the user interface has been changed considerably and a great many refinements have been added.

It consists of a video terminal, twin DRI floppy disc drive and a Diablo or Qume daisy wheel printer. The VDU, built by Logica themselves, is 80 characters wide with sideways scrolling, but a 132-character screen is available as an option.

Logica has concentrated its efforts in the design first and foremost on simplicity of operation, for the benefit of the typist. To this end the editing controls have been divided into three levels.

At the most basic level only three function keys are needed, and with these most input typing can be carried out. For more elaborate tasks such as typing tables and moving text about, another set of control keys is used; and, at the third level, the seldom-used functions are initiated by pressing a "command" key followed by a mnemonic code on the letter keys.

A special "table mode" is provided for constructing and editing columns of figures that the normal editing functions on a word processor will not handle correctly.

Another novel feature is the way text can be saved away and moved from one place to another, in either of two forms, a "string" or a "block". A string is text that when moved to a new part of a document will fit itself in between the margins, causing the rest of the paragraph there to be reformatted accordingly. A block, on the other hand, is a rectangular piece of text that will retain its shape wherever it is placed.

The screen character generator is driven from a ROM that can be exchanged to provide a large range of special characters, Greek letters, scientific symbols, and so forth, and also subscripts and superscripts. These would be used with a twin-head printer.

As an option, the VTS/100 can communicate either with another of its own kind or with a Unicom system.

At a price of £10,500, VTS/100 is definitely an up-market machine. According to Logica's thinking, many firms regard time saved in typing, by clever editing features, and in training as valuable enough to justify the extra cost. "Many word processors are computer programmers' machines," says Pat Coen, Logica's word processing director. "This is a typist's machine."

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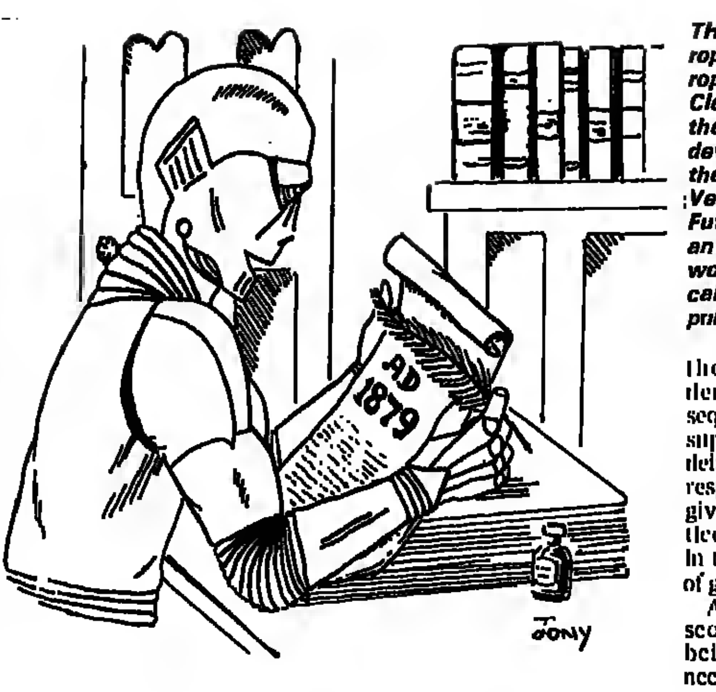
FUTUREVIEW



Shadows of the Coming Race

THE 19th century philosopher Nietzsche, said that Man is a rope stretched between the animal and the superman — a rope across the abyss. In previous Futureviews, Arthur C. Clarke and Isaac Asimov are two writers who have suggested that Nietzche's superman, rather than being human, will be a development of the computer. Inspired prophecies as to what the future hides from us are not new, they go back to Jules Verne, H. G. Wells, and even Cyrano de Bergarac. In this Futureview ROBIN WEBSTER provides an edited version of an essay that has been overlooked. Written by the famous woman novelist George Eliot, the essay was part of a book called "Impressions of Theophrastus Such" which was published in 1879.

"AM I already in the shadow of the Coming Race? And will the creatures who are to transcend and finally supersede us be steely organisms, giving out the effluvia of the laboratory, and performing with infallible exactness more than everything that we have performed with a slovenly approximativeness and self-defeating inaccuracy?"

So asked Theophrastus Such, the central character of a book,* by George Eliot, which was published in 1879.

Called "Impressions of Theophrastus Such", the book is a collection of discussions between the fictitious character Theophrastus and some of his equally fictitious friends. In this particular case, the discussion was in an essay entitled "Shadows of the Coming Race", and the fictitious friend was called Trost. He is described by Theophrastus as being "no optimist as to the state of the Universe hitherto, but who is confident that at some future period within the duration of the solar system, ours will be the best of all possible worlds."

Theophrastus, however, is less convinced of this and has "a fearful vision of the human race evolving machinery which will by-and-by throw itself fatally out of work."

In 1879, of course, there were no real computers save for the progeny of the mechanical calculator devised by Blaise Pascal in the 17th century, and the rather more sophisticated — yet still mechanical — calculating engines designed by Charles Babbage.

But Theophrastus observed, when in the Bank of England, "a wondrously delicate machine for testing sovereigns, a shrewd implacable little steel Rhadamanthus that, once the coins are delivered up to it, lifts and balances each in turn for the fraction of an instant, finds it wanting or sufficient, and dismisses it to right or left with rigorous justice." It was this and other mechanical wonders of the day that caused him to make the exclamation about "steely organisms" at the beginning.

In answer to this, Trust sparked off the main discussion in a sceptical tone: "You forget that these wonder-workers are the slaves of our race, need our tendance and regulation, obey the mandates of our consciousness, and are only deaf and dumb bringers of reports which we decipher and make use of. They are simply extensions of the human organisms, so to speak, limbs immeasurably more powerful, ever more subtle fingertips, ever more mastery over the invisibly great and the invisibly small.

"Each new machine needs a new appliance of human skill to construct it, new devices to feed it with material, and often keener-edged faculties to note its registrations or performances. How then can these machines supersede us? — they depend upon us. When we cease, they cease."

Thinking he had made his point, Trost left the argument there, but Theophrastus was quick to reply.

"I am not so sure of that," he said. "If, as I have heard you contend, machines as they are more and more perfected will require less and less tendance, how do I know that they may not be ultimately made to carry, or may not in themselves evolve conditions of self-supply, self-repair, and reproduction, and not only do all the mighty and subtle work possible on this planet better than we could do it, but with the immense advantage of banishing from the earth's atmosphere screaming consciousnesses, which, in our comparatively clumsy race, make an intolerable noise and fuss to each other about petty ant-like performance, looking on at all work only as it were to spring a rattle here or blow a trumpet there, with a ridiculous sense of being effective?

"I for my part cannot see any reason why a sufficiently penetrating thinker, who can see his way through a thousand years or so, should not conceive a parliament of machines, in which manners were excellent and the motions infallible in logic."

After taking this veiled aside-swipe at the peers of the realm, Theophrastus went on to highlight again how machines were already used with great accuracy and effect in many areas such as the Sheffield steel industry where one used high electric discharges to pare "thick iron as if it were mellow cheese."

However, Trust, the willing devil's advocate, rejected this and pointed out the potential benefits of machines helping man: "....what you have heard me say is, that our race will and must act as a nervous centre to the utmost development of mechanical processes: the subtly refined powers of machines will react in producing more subtly refined thinking processes which will occupy the minds set free from grosser labour.

"Say, for example, that all the scavenger's work of London were done, so far as human attention is concerned, by the occasional pressure of a brass button (as in the ringing of an electric bell), you will then have a multitude of brains set free for the exquisite enjoyment of dealing with the exact sequences and high speculations supplied and prompted by the delicate machines, which yield a response to the fixed stars, and give readings of the spiral vortices fundamentally concerned in the production of epic poems of great judicial harangues."

Added Trost with a bite of scorn: "So far from mankind being thrown out of work according to your notion, if it were not for your incurable dilettanteism in science as in all other things — if you had once understood the action of any delicate machine — you would perceive that the sequences it carries through the realm of phenomena would require many generations, perhaps aeons, of understandings considerably stronger than yours, to exhaust the store of work it lays open."

Agreeing with Trost on this point, Theophrastus replied: "Precisely, it is the feebleness of my capacity, bringing me nearer than you to the human average that perhaps enables me to imagine certain results better than you can .... it is less easy to you than me to imagine our race transcended and superseded, since the more energy a being is possessed of, the harder it must be for him to conceive his own death.

"But I can easily imagine myself and my congeners dispensed with in the frame of things and giving way not only to a superior but vastly different kind of Entity. What I would ask you is, to show me why, since each new combination or structure brings into play more conditions than its inventor foresaw, there should not at length be a machine of such high mechanical and chemical powers that it would find and assimilate the material to supply its own waste, and then by a further evolution of internal molecular movements reproduce itself by some process of fission or budding."

Theophrastus went on to explore this avenue of thought in more detail: "This last stage having been reached, either by man's contrivance or as an unforeseen result, one sees that the process of natural selection must drive men altogether out of the field; for they will long before have begun to sink into the miserable condition of those unhappy characters in fable who, having demons or djinns at their beck, and being obliged to supply them with work, found too much of everything done in too short a time.

"What demons so potent as molecular movements, none the less tremendously potent for not carrying the futile cargo of a consciousness screeching irrelevantly, like a fowl tied head downmost to the saddle of a swift horseman? Under such

● Turn to page 11

Downtime appears on Page 11

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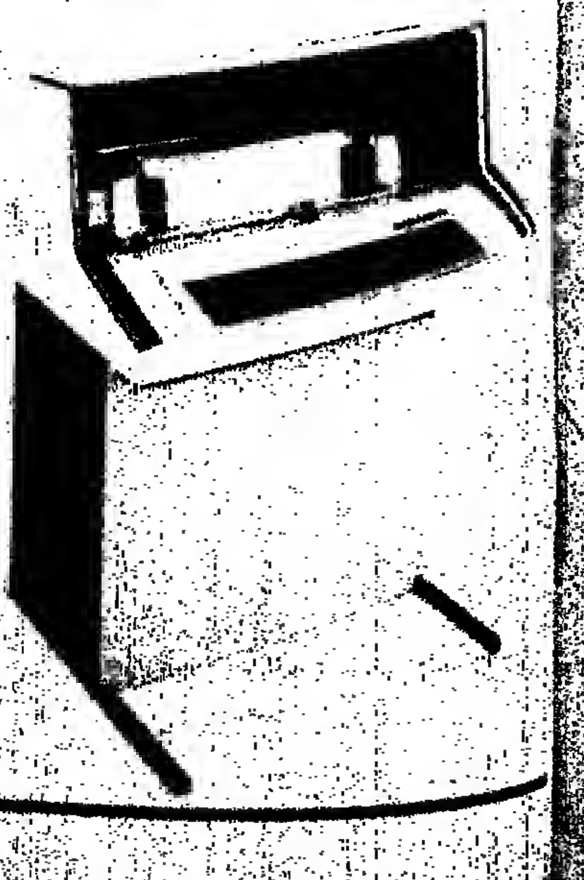

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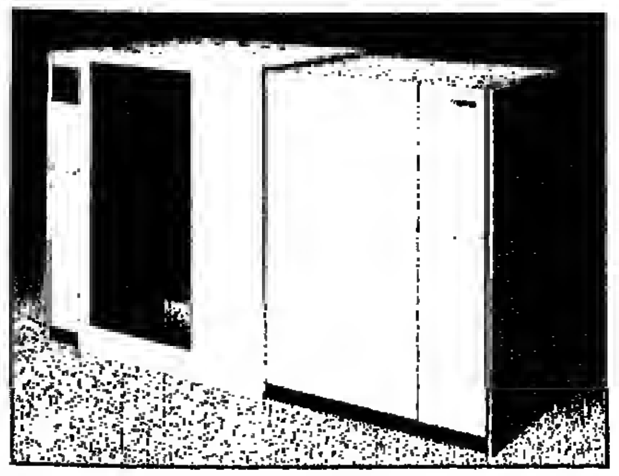

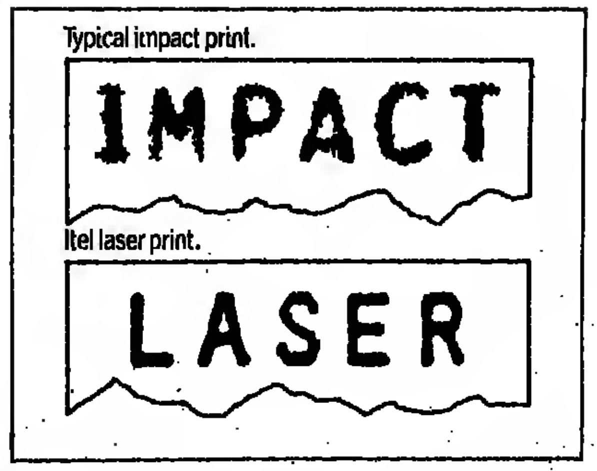
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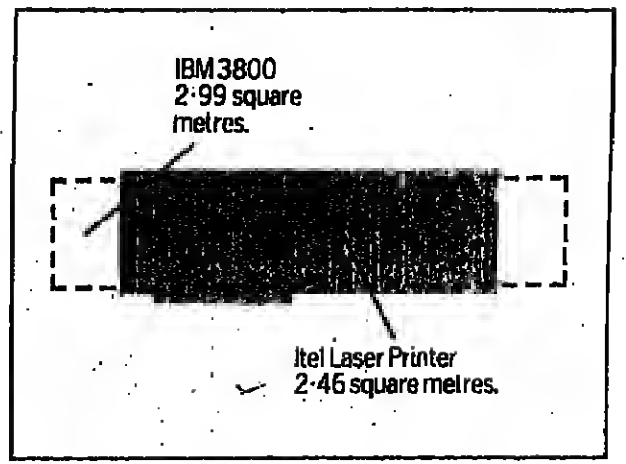

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GILB'S MYTHODOLOGY

'Maintainability' is more than structural coding

WE have become very interested in ease of maintenance of programmed systems. Rightly so, when we see the current cost in money, manpower and time.

Prophets have shouted that the answer is "structured": structured programming, structured coding, structured design and structured files (databases?). Maybe some structure is better than none in some cases. But the situation is not a very structured one, from a management point of view.

We are throwing conjectural solutions at badly structured problems, and it is very hard to find evidence that we are making any real progress. I have a suggestion.

Let us structure our approach. Let us organise maintainability technology into a knowledge structure. Let us select appropriate maintainability technology based on a structured decision-making sequence.

Let me define maintainability. It is the probability of our being able to change the "state" of a system, within a given time period. It is best described as a curve of the probabilities of changing the system, plotted against time. But often a single point on the curve can suffice for purposes of specification.

For example: program A is designed to allow maintenance programmers P to repair representative faults B with a 90% probability of completing the change and required post-maintenance testing within two hours. This shall be measured in a controlled acceptance test using artificially embedded errors.

Maintainability technology should not simply be defined as those techniques which "improve" this measure. We must consider side effects on other quality aspects of our system. It is of little practical interest to get maintenance changes effected which seriously threaten the operational reliability, conversion portability or even later maintainability of the system.

As an example of this a group in Texas reported in Data Management (November, 1975) that they had performed a controlled experiment, with two program changes carried out by 12 individual programmers, using alternatively written and audio tape program documentation. The total time for 12 maintenance attempts using conventional documentation was 524 minutes and it was 492 minutes using "audio" documentation; in other words, about the same.

The estimated cost of documentation in audio format was estimated to be about one fourth (75% cost reduction). So in this example, we see an alternative technique to conventional ones which contribute to maintenance ability, and it is interesting not because it is superior but because it promises to give about the same results at a substantially lower cost.

The next fallacy about maintainability technology is that it has to do with improving human ability to understand programmed logic. This is only a special case. The important thing is the needed change or repair. We don't have to understand an error, or the old program, if we can successfully replace it with a correct program or program module. This is simply a "spare parts" maintainability concept.

However, we must stop writing and speaking as though programs are the only parts of systems which need maintenance effort. A systems orientated maintainability strategy will consider repair and change to all major components of a system to be on an equal footing.

One of the practical consequences of this is that maintainability techniques, like automatic data base audit programs, will get a higher priority than currently popular techniques. This is because they give some help to the maintainability problem of programs testing complex files for logical bugs after a maintenance change; files, ensuring compliance with planned record formats and codes; and even hardware, showing the location and extent of hardware failure which has corrupted files.

In addition the cost of using such a tool is attractive because it is automated. In fact it is really an absolute necessity for current large and complex file systems, in spite of the fact that the majority of us do not initially plan systems with such a maintainability tool.

Most of us do not even think of a file audit program as a maintainability tool.

It is today possible to make a well structured hierarchical list of several hundred "maintainability" ideas which our programmed systems can benefit from.

It is possible to estimate the qualities and costs of each technique.

It is difficult, though possible and practised, to indicate the measurable effects of combinations of these techniques. I hope that previous and future columns here will unfold that rich technological world for those yet uninitiated.

GILB'S HYPOTHESIS: we can and should "engineer" maintainability into software.

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SOFTWARE FILE-1

Small men link up to fight IBM and AT&T

FEARING "great aggression" by IBM and AT&T in software, a group of US program product companies has joined forces to fight back. The new faction calls itself Spiac, Software Products Industry Advisory Council.

Spiac said that its mission was threefold: to improve the image of the "independents" in the software product business; to combat what it calls "unfair and anti-competitive" moves by IBM and AT&T in the software marketplace: and to address the problem of capital formation, including a plan to ask Congress for investment tax credits for software.

In addition to lobbying on its own the group is funnelling many of its proposals through two established channels: the Association of Data Processing Service Organisations, Adapso, and the Computer and Communications Industry Association, CCIA.

Turnkey Systems said, "Because we are a small, homogeneous group, we can adopt a position without having to convene a board of directors which meets only rarely."

Most Spiac members are also members of either Adapso or CCIA and they feel that the established organisations will court Spiac rather than run the risk of losing their software product membership altogether.

Many Spiac member companies were "feeling frustrated" with the existing bodies, commented Spiac member Marty Goetz, executive vice-president of Applied Data Research. "It was felt that they weren't acting as quickly or as strongly as they could to tackle the problems of immediate concern to their software product membership," said Goetz.

Spiac hopes to force Adapso and CCIA to be more aggressive in the software area.

According to Keet, Spiac has already scored some successes in working through Adapso and CCIA. Under the auspices of Adapso, a meeting between independent software companies and IBM resulted in the industry giant agreeing to provide them with information on interface specifications and system modifications as this information becomes available.

Keet explains that the move puts software companies on an equal footing with IBM's hardware competitors which already receive such data without having to dig for it.

Similarly, CCIA goaded by Spiac, made a formal request to the Justice Department to enjoin AT&T from the marketing of software.

Dataskil says bye-bye to Bird in favour of Status

THE information retrieval system Status II is to be marketed by ICL Dataskil for the 2900 range, possibly including the 2904. The move marks the end of Dataskil marketing of Bird, the similar system originally developed at the Queen's University, Belfast.

Dataskil is one of the members of the Status Club, the Department of Industry's project to promote Status II as the UK standard for information retrieval systems (Software File, May 18).

According to John Luce, of Dataskil, a version for the 2904 is currently being tested. The company is also considering implementing Status in conjunction with CAFS, the back-end file management system.

Status uses a database of free text, divided into "articles" — one article being the fundamental unit of storage. In addition, the system maintains a system of inverted files, pointing in to each instance of one of the key-words in the main file.

Rather, however, than requiring the user to predefine a key-word list, the system treats every word as a key-word unless instructed not to. Words nearly always omitted from the extraction process would include, for example, common prepositions such as "as", "to" and "from".

The creation of the key-word index, which is essential for subsequent online searching, is performed as part of the batch-mode input procedure and roughly doubles the storage which would be required for the text alone.

The system provides a simple command-driven language for online retrieval, using Boolean AND, OR, and NOT. Searchers are not obliged to consider the entire bank, but can restrict the scan for example to the examination of document abstracts or titles.

Luce said that two sales have been made of Bird, which was created by Dataskil from Belfast's Quobird software and came on to the market about two years ago (CW, April 8, 1976). It is likely that these customers will now be offered Status II on very favourable terms, he said.

Scope office

THE originators of Scope-2903, the TP monitor for ICL 2903/2904 systems, have opened an office in Leicester following the sale of the package to two local companies. C. P. Computer Support Services, which will retain its Birmingham office, is based in Leicester at Haymarket House, Haymarket Centre.

EBCDIC—Ascii converter

A PROGRAM for converting EBCDIC format files to Ascii or vice versa, is available from Southwark Computer Services either as a bureau service or as a utility for in-house use.

Of particular interest to those who use both IBM mainframes and Digital Equipment PDP-11 minicomputers, the program also offers facilities for resequencing, extending, or curtailing fields, and for creating test files or formatted file listings. It sells for £250.

Sales of MMS

FOUR further sales of the MMS general ledger and financial reporting system, valued at around £70,000, have been announced by Package Programs. New users include Bowater Scott, which operates a 1901T, and Englehard Industries, Faberge, and Ingersoll-Rand, who all operate IBM 370s under DOS.

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SOFTWARE FILE-2

EDITED BY PETER HEWITT

Compatibility the theme of PDP-11 Adabas

A VERSION of the Adabas database management system is being developed by Software AG for the Digital Equipment PDP-11 range. Major attractions of the new implementation will be compatibility with the existing IBM 360/370 versions and the ability to support back-end database processing.

The software, currently in the first phase of testing, will run under RSX-11 or IAS operating systems on machines ranging from the 11/34 to the 11/70. It is due to be released on January 1, 1979 and is likely to cost between £20,000 and £25,000.

Adabas on the PDP-11 will support user programs written in Basic, Cobol, Fortran and Assembler. Also available will be an online relational style query language. This will be a subset of Adacom, which is scheduled to appear for the first time in the next mainframe release in the third quarter of this year (Software File, February 9).

In contrast to the mainframe version, the PDP-11 system will be fully driven by a data dictionary, use of which will be mandatory. Holding all file and field definitions, the dictionary will be accessed dynamically by application programs and inquiry routines.

Other features of the system include provision for conversational teleprocessing and facilities for warm start and roll-forward recovery. The software is fully re-entrant and multi-threading.

Although not supported in the first release, capabilities for back-end and distributed processing are planned for later versions.

According to Len Jenkinson, managing director of Adabas Software Ltd in the UK, only minor modifications will be necessary to produce a back-end version. Calls to Adabas from user programs all pass through a macro interface, Adamint.

A relatively small change in the macros would enable database processing requests to be directed from a host 370 to a minicomputer dedicated to the database.

The relative ease of this operation appears to contrast with Cullinane's implementation of a back-end IDMS system (CW, March 16), which required the construction of major communications software.

Jenkinson pointed out that the portability of a database application system would depend on the degree of compatibility between the language compilers on each machine. Also, although the central core of Adabas, including the program call mechanisms, would be the same in both versions, the mainframe version could clearly support a more extensive superstructure.

The 360/370 version, for example, would shortly support a comprehensive online data manipulation language, Natural, with the capacity for file creation and updating. This was unlikely to be implemented for the PDP-11.

Adabas is currently available only on IBM 360/370 and Siemens computers, and has over 200 users. Basically an inverted file system, it is highly regarded from the standpoint of ease of use and throughput performance.

DEC offers two DBMS for the PDP-11 range: DBMS-11, based on Cullinane's IDMS, and RMS-11, a simpler data management system. Also available on the PDP-11 is Cincom's Total.

PROGRAMMER NOTES

The semantics of Fortran 77

ONE of the significant characteristics of Fortran 77 (CW, May 18) is a tightening up of the semantics of the language. This is likely to lead to a number of problems for existing programs and programmers when full ANSI X3.9-1978 compilers come into service.

Most of the enhancements provided in the new standard consist of powerful and useful syntactical extensions to the language, such as file and character handling facilities and the incorporation of structuring constructs, for example IF ... ELSE ... ENDIF.

In some areas, however, notably the DO loop, Fortran 77 not only extends the syntax but also refines the meaning of existing expressions.

One possible pitfall, for example, is the assumption made in many programs that a DO loop will be performed at least once, regardless of whether or not the final condition is satisfied before the loop is entered.

In Fortran 77, initially satisfied DO loops will not be entered.

Further, the number of iterations and the increment will be computed at the start of the loop. Parameters subsequently altered within the loop will thus not modify the execution.

In these and similar cases, the Fortran 66 standard described the performance of the language as undefined. It thus left the compiler writer to decide how the construction would perform, inviting implementers to specify the behaviour of the compiler in their manuals.

The more precise semantic definition of Fortran 77 could thus lead to a number of apparent incompatibilities with Fortran 66 programs. Apparent, not real, it is claimed, as the earlier standard left the effect of some constructions unspecified, rather than defining them differently.

However, many compilers in fact left such variables unaltered and programmers came quickly to rely on this feature.

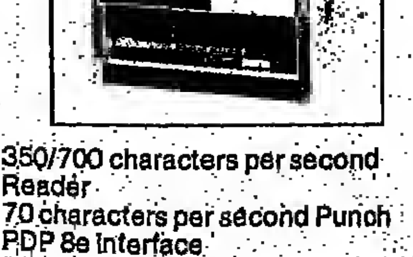
Fortran 77 however provides an explicit mechanism — the SAVE instruction — which allows the programmer to specify that any or all local variables or common block values are to be preserved.

Implementers may well take the view that variables not explicitly saved should in fact be cleared. This again could cause many existing programs to fail.

In addition to program portability, problems could arise with programmer portability: most programmers learn Fortran by trial and error and are not aware of the extent of current implementation-dependent features.

However, many implementers are likely to provide facilities to ease the transition. Compile-time options are one way to eliminate unexpected effects when old programs are processed by Fortran 77 compilers.

The character handling facilities introduced by Fortran 77 include a new character string constant format, delimited by apostrophes eg "THIS IS A CHARACTER CONSTANT." Pending publication of the final standard, it is still not clear whether Fortran 77 will retain Hollerith strings, eg 28HTHIS IS A HOLLERITH CONSTANT, as a legal format.



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Puzzler

THIS week's cryptarithm reads like part of a program. It's a straightforward addition sum, and the solution is unique where Eighty is even. See page 45 for solution.

```
 THEN
 TEST
EIGHT
TIMES
  TEN
-----
EIGHTY
```

Datamanager release increases flexibility

THE latest release of MSP's Datamanager, No 2.0.2, offers several new features aimed at increasing the flexibility and integrity of the data dictionary system. In some cases there is a major internal reorganisation since the last main release, No 1.4.3.

One of the innovations, Status, is the ability to logically partition the dictionary, in effect allowing up to 255 alternative definitions for each library element. Intended particularly to enable a single dictionary to hold past, present and future data definitions, the facility permits the data administrator to freeze production documentation while allowing the description of development versions to be updated.

Status can also be used to provide each user group with a self-contained subset dictionary.

Another new feature is full automatic error recovery. Based on a transaction logging file, this protects against potential dictionary corruption or data loss should the system fail during updating or access.

An Access/Call facility now enables user programs to extract dictionary information during execution, providing both active and dynamic use of the dictionary.

The Call command would enable a user program to access edit criteria from the dictionary.

Interface extensions in the release include support for IMS data definitions in the IMS (DL/I) interface module, and support for online updating under CICS. The system previously catered only for interrogation under CICS.

Datamanager already interfaces fully with Roscoe, TSO, ETSS, and VM/CMS; interfaces for JMS/DC and Task/Master are scheduled for release later in the year.

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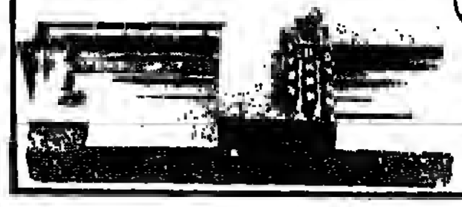

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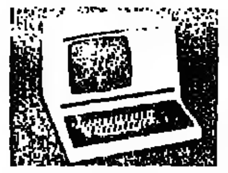

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COMPUTASTARS

Times and places of future heats

Computastars is organised by John Goldsmith Computer Services which is also sponsoring all the other heats.

The heats still to run are: South of the Thames, on June 11 at the Croydon Sports Arena; North of the Thames, June 18 at Willesdon Stadium; the North-West, June 25 at the stadium of the Kirkby Sports Centre, Liverpool; and the Midlands, July 9 at the New Alexander Stadium, Perry Park, Birmingham.

Anyone who wishes to help in the organisation and running should contact Gordon Colms at Goldsmith's, 18 Buckingham Palace Road, London SW1 OPP, tel: 01-828 5368.

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It's an early bath for systems programmer Andrew Borys of Burmah Oil (seated in striped jersey) as he falls at the water jump in the steeplechase. Others in the water with him (left to right) are Phil Adams from CM&G, Ken Potter from Wales Gas and Finlay Gommell from Rank Xerox.

South-West heats show clear winner

THE South-West heats of the Computastars competition, which took place at the Whitchurch Sports Centre in Bristol in May, provided a clear winner in the ladies' events with much closer competition among the men.

Christine Charmley, a programmer from Rank Xerox in Mitcheldene, Gloucs, should be one of the favourites for the women's individual championship when the Computastars final is held in London later this year.

The hockey-stick is just a blur as Christine Charmley strikes her way forcefully to her victory as women's individual champion.

Christine won the Bristol heat 13 points ahead of her nearest rival, Liz Clements, a programming manager with Burmah Oil in Swindon.

Liz was captain of the Burmah Oil 2 team but it was her colleagues from Burmah Oil 1 who won the women's team event with 123 points, from Foster Wheeler of Reading with 109 points.

In the men's team event, there was a close tussle between the Rank Organisation from Plymouth — the only entry from Devon and Cornwall — and Wales Gas in Cardiff, with the Devonians eventually winning by 117 to 107½ points. But for Wales Gas — who had to pay all their own expenses to take part — the trip was worthwhile as they will also go through to the Computastars final, as will the girls from Foster Wheeler.

Graham Jenkins, a programmer with CM&G Insurance group in Bristol, had an exciting duel with Wales Gas operator Andrew Lawls. Graham eventually won by 27½ to 23½ points.

Just call me Steve Austin! . . . winner of the "bionic man" title in Bristol is Graham Jenkins, also hitting out firmly towards the Computastars final later this year.

In the plate competition, for those who lost in the preliminary round, a team from British Steel in Port Talbot proved to be runaway winners and they too go into the finals.

As with all Computastars events, contestants take part in a variety of activities aimed at testing their all-round sporting abilities. At Bristol, these events included football penalty taking for the men and netball for the girls, frisbee, wellie boot and cricket ball throwing, hitting a cricket ball with a hockey stick and, at the end of the gruelling day, an exhausting steeplechase.

JUNE 6
Online searching in MAPP, S. M. Johnston. UK User Group for Online Information Systems. Animal Breeding Research Organisation, West Mains Road, Edinburgh. 14.00.

JUNE 5-8
US National Computing Conference. IEEE Computer Society, Anaheim, California.

JUNE 6
Computers, an aid or an impediment to creativity, Mike Cooley. BCS 1978 Lecture Series. London School of Economics, London WC2. 18.30.

JUNE 6-8
International Word Processing Exhibition and Conference. Business Equipment Trade Association. Wembley Conference Centre, London.

JUNE 7-8
Telecommunications group meeting. ISM Computer Users' Association. De Vere Hotel, Coventry.

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PEOPLE

Firnberg president of APM

RECENTLY elected president of the Association of Project Managers, known as Internet UK, is David Firnberg, the director of the National Computing Centre.

He succeeds Professor Geoffrey Trimble of Loughborough University, who was president since the association's formation six years ago, and who will continue to represent it on the international body, the International Management Systems Association.

Brian Gray has been appointed director of marketing at Sweda, and **Peter Hodgins** becomes publicity manager.

William Sela has joined the Remex division of Ex-Cell-O in Irvine, California as vice-president and general manager. Previously he was Western operations manager of Cincinnati Milacron in Newport Beach and district manager of Texas Instruments in Orange, both in California.

Obituary

Jim Richardson

Jim Richardson, manager of the continuous stationery department of John Dickinson Stationery, died suddenly on May 11.

Brian Gifford, general manager of Ultronic Data Systems, has been appointed managing director.

Norman Atkinson joins Atlantic Computer Leasing as Northern area sales manager, from Telex Computer Products where he was Northern area sales manager for peripheral products.

Roy Steel, formerly a principal consultant with Leasco Software, is to join Anda Software as telecommunication systems manager. **Brian Danen** has joined Anda as a senior consultant, from Leasco where he was a consultant.

David Moseley has joined Sintrom Electronics as Southern area sales manager. He was formerly with Gen-Rad selling automatic test equipment.

Bob Brown joins management consultants Touche Ross from Cable and Wireless where he was computer marketing manager.

Fine

Gleave

Sue Fine, previously European area co-ordinator of DP services for Hilton International, has joined Cara Consulting in London, the Aer Lingus computer services subsidiary, as a senior consultant on the Datahost project team.

Teresa Gleave, until recently a senior programmer at Mercedes Benz UK, has joined BIS Applied Systems as a consultant.

David Smith, accountant of Gordon and Gotch Computer Group, has been appointed to the new post of commercial manager of the group. **Robert Guest**, who until recently was involved with the development of the Fastmail and Total Subscription Service packages, has been appointed to the new post of manager, publishing systems.

Mike Ayres, previously distributor sales manager with Centronics, has been appointed UK OEM sales manager. **Mike Boyle**, formerly account manager in Northern England, has succeeded Ayres as distributor sales manager, and **Philip Hadwell**, also a former account manager, has been appointed European manager, market development. **Gary Lea Mason** joins Centronics from Control Data as an OEM sales executive.

Robert Wilmot has become managing director of Texas Instruments in the UK. Previously he was professional calculator manager with the Consumer Products Group in Texas.

Tony Motley who until recently was project manager with Redifon Computers on the British Rail OCR contract, has been appointed international systems engineering manager. **Roy Hamilton**, formerly Northern regional manager, becomes manager UK field marketing operations, UCR.

Soccer

Lloyds beat SIA 3-1 in the final of the winter knock-out cup played at the ground of Woodford Town Football Club. Lloyd Bigby gave SIA an early lead but goals through Osborn in the 29th and 45th minutes and Gazapi in the second half, saw Lloyds home.

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Office of the future on show at Wembley

RORY JOHNSTON previews the International Word Processing Exhibition as more and more suppliers rush to join this increasingly competitive field.

THE long and the short and the tall of the word processing manufacturers will be converging on Wembley Conference Centre, London, next week, for the Word Processing Exhibition and Conference, organised by the Business Equipment Trade Association. At last count, there were 27 different makers of word processors planning to be on show, as well as 15 suppliers of ancillary equipment, dictating systems, and so forth.

This is the third UK WP exhibition, and the first to be called "International". It will run from June 6 to 8, opening hours 9.30 to 5.30. Admission is free to holders of business cards; others should contact BETA on 01-405 6233 for a ticket.

The conference will consist of three seminars, running concurrently with the exhibition. Two will be on June 6, intended as introductions to the subject of word processing, one for office managers and admin staff in charge of services, and the other for secretaries, typists, and typing supervisors.

The third seminar will cover two days, June 7 and 8, and will go into the subject in much more depth. Consultants Mike Thornley and Alan Paterson will be speaking, together with Phil Dorn and Jeb Eddy from the US. The experience of sophisticated users will be given by Harry Belsey of SP, and Cyril Haworth of West Midlands Gas.

Several new products will be on show for the first time at the exhibition. Among these will be the Xerox 850 display word processor, the **Datatext** IV shared-logic system, **Logica's** VTS-100 stand-alone unit (see page 3), and the **Monotype** 80 microprocessor based system. And on the **Hamilton Rental** stand will be the Digital Equipment WS78, which the company markets in the UK.

Clustered systems, having two or three screens and fitting in between stand-alone machines and shared-logic systems in the word processing scheme, are much in the news nowadays, and new hardware of this type will be shown by **Wang**, with their WP25, and by **Wordplex**.

Ultronic Data Systems are introducing the UDS-Ricoh "U" text input station, which is aimed at relieving the bottleneck at the input stage of WP. Consisting of a keyboard, single-line display and floppy disc drive, it is cheaper than a complete word processor and is aimed at users who have too much input for a single machine but do not want to go to the expense of buying a second unit. Discs from the input station are transferred to the main word processor for editing and printing.

Typesetting direct from a word processor is another hot topic, and **Wordwright** will be demonstrating this, using a Dymographic Pacesetter fed from its word processor. Instant printing of a visitor's own text can be very impressive.

Among the suppliers of accessories and related equipment, **Dictaphone** will be showing a computer-controlled central dictating system. **Facit-Addo** will have both the Qume twin-head and wide track printers on its stand and special multi-part continuous stationery will also be on show.

It will be interesting to see how much the technology of WP, still really in its infancy, has matured since last year's show. Equipment is still coming onto the market with the most glaring flaws in its design: screen typing stations which split words at the right-hand margin, sheet feeder-stackers that stack the typed pages in reverse order, so they have to be re-shuffled by hand. Unfortunately, many customers are not sophisticated enough to realise how much better the equipment could be.

Ease of use is still, and will continue to be, the fundamental issue. It is very difficult to tell from a slick demonstration how staff will find a machine in practice; only a lot of experience, and a lot of impartial advice, will enable people to judge soundly. Interestingly enough, the big established manufacturers are by no means the leaders in the ergonomics of WP. It will be up to discriminating users to sift the wheat from the chaff among the produce at Wembley next week.

AES PLUS, a stand-alone screen word processor to be shown at Wembley next week.

DOWNTIME

The birth of Benn

AS well as laying his claim to be the father of ICL — a distinction which Harold Wilson also claims in his memoirs — Energy Minister Tony Benn used the occasion of the inauguration of the ICL 2980 at the UK Atomic Energy Authority in Risley (CW, May 25) to regale the assembled multitude to some funny stories.

Like the time when he was visiting a Russian computer installation in Kiev. In order to show the ingeniousness of the Soviet-made machine, he was asked his birth date so that the system could tell him which day of the week that was.

Having told them his birthday (it's April 3, 1925 in case you wish to put him on your birthday card list), it responded by saying, THAT WAS A FRIDAY.

"That is quite right. How wonderful," replied Benn.

"But how do you know it was a Friday," asked a serious Russian scientist.

"Because I remember being terribly excited on the Thursday," he replied. But apparently the joke got lost in translation and his Russian hosts were not amused.

Before engaging in a brief online dialogue with the 2980 to officially inaugurate the system, Benn also told the tale of when the Queen initiated the STD telephone system.

The idea was that she would dial the number of the Lord Mayor of Bristol. But as she approached the telephone, she was heard to mutter: "I have forgotten the number."

Off-stage, a foolhardy but honest engineer was heard to say "Don't worry luv. Whatever number you dial you'll get the Lord Mayor."

Breakthrough with micro data highway system

A BREAKTHROUGH in high-speed communication between minicomputers has been achieved by the UK-based Cambridge Consultants, subsidiary of Arthur D. Little.

Working in conjunction with the Admiralty Surface Weapons Establishment, Cambridge Consultants has developed a high-speed, high-integrity serial highway which enables information to be shared between up to 127 minicomputers.

The application emphasises once again the versatility and power of the AMD 2904 4-bit bit-slice bipolar microprocessor.

Widely used as the basis of processors designed to emulate the instruction sets of earlier machines, two AMD 2901s are used in the highway as the driver for a specially designed minicomputer front-end processor. Its use enables minis to communicate at speeds in excess of one Megabit per second.

A microprogram held in bipolar PROM was developed for the front-end on a Digital Equipment PDP-11 mini. A cross-compiler was designed for this purpose, which is based on a proprietary Cambridge Consultants skeleton compiler.

Versions are available for several different minicomputers, and ASWE has agreed that Cambridge Consultants may market the system commercially.

Among the markets currently being considered are distributed processing, using already installed minicomputers, and message switching where high integrity is required. The current range of machines for which interfaces exist are the Ferranti Argus 700S and E, the GEC Lucas, the Konsberg, and the Digital Equipment PDP-11.

Shadows of the future

● From page 4

uncomfortable circumstances our race will have diminished with the diminishing call on their energies, and by the time that the self-repairing and reproducing machines arise, all but a few of the rare inventors, calculators, and speculators will have become pale, pulpy, and cretinous from fatty or other degeneration, and behold around them a scanty hydrocephalous offspring.

"As to the breed of the ingenious and intellectual, their nervous systems will at last have been overwrought in following the molecular revelations of the immensely more powerful unconscious race, and they will naturally, as the less energetic combinations of movement, subside like the flame of a candle in the sunlight.

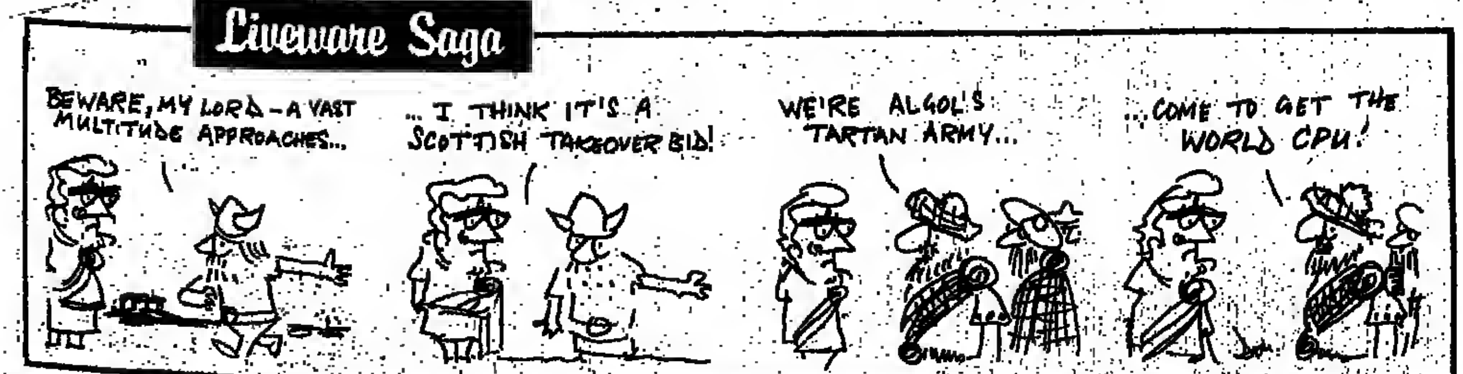
"Thus the feebler race, whose corporeal adjustments happened to be accompanied with a maniacal consciousness which imagined itself moving the mover, will have vanished, as all less adapted existences do before the fittest, i.e. the existence composed of incorporating new groups in harmonious relation. Who — if our consciousness is, as I have been given to understand, a mere stumbling of our organisms on their way to unconscious perfection — who shall say that those fittest existences will not be found along the track of what we call inorganic combinations, which will carry on the most elaborate processes as mutely and painlessly as we are now told that the minerals are metamorphosing themselves continually in the dark laboratory of the earth's crust?

"Thus this planet may be filled with beings who will be blind and deaf as the inmost rock, yet will execute changes as delicate and complicated as those of human language and all the intricate web of what we call its effects, without sensitive impression, without sensitive impulse: there may be, let us say, mute orations, mute rhapsodies, mute discussions, and no consciousness there even to enjoy the silence."

"Absurd!" grumbled Trost, as vehement as ever.

*Impressions of Theophrastus Such, by George Eliot, published in 1879 by Bernhard Tauchnitz, Leipzig.

Liveware Saga



BEWARE, MY LORD — A VAST MULTITUDE APPROACHES...
... I THINK IT'S A SCOTTISH TAKEOVER BID!
WE'RE ALGOL'S TARTAN ARMY...
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Getting computers on the side of the citizen

Attending the Strasbourg conference was KENNETH WARREN (right), Conservative MP for Hastings, who is a member of the committee on science and technology of the parliamentary assembly of the Council of Europe. Here, reporting for Computer Weekly, he gives his impressions of the conference.

THE Council of Europe has made a bid for the leadership role at the centre of Europe's new parliamentary data processing systems. At the Palais d'Europe, Strasbourg, 120 MPs and computer experts from the council's 20 member parliaments met to examine progress and define objectives.

A strong UK team included the leader of the British delegation to the council, Labour MP Tom Urwin; Lord Darling, head of the UK Parliament's DP committee; Tory MP Ian Lloyd; and Ron Brown, MP, a former chairman of a Council of Europe sub-committee on DP.

Missing from the sumptuous conference facilities was any sign of industry. Here was Europe's first definition of systems suitable for parliamentary DP, networks between parliaments and calls for standardisation. Yet not a soft sell could be heard above the din of Strasbourg's nesting storks.

For seven years the council has been reviewing DP hardware and software requirements and progress in the member parliaments. A specialist sub-committee of the council chaired currently by Swedish MP, Lennart Petterssan, constructed the format af the "Round Table on the use of Data Processing for Parliamentary Work."

The committee had examined on-site the work of the parliamentary establishments in Rome, London, Bonn, Brussels, Paris and Stockholm. It was considered the time was ripe to bring together the national strands of interest and experience to formulate a Euro-policy.

More work, of course, remains. If anything, this was only a formal start for a uniform policy across a European parliamentary system representing 250 millian peaple. The cancept af a standard system is in advance of US thinking — the rest af the world is not even in the race. This made the absence af the industrial interests even mare extraordinary.

Scrutiny of the papers presented by experts showed that people had came to Strasbaurg not to ask how ta da the jab but how to get the job dane. Mast citizens of Europe feel our parliamentary institutions mave at a snail's pace. Here was a dramatic and refreshing answer.

Discussion ranged beyond systems into the concern of a citizen for privacy. Ranged against this was the citizen's equal need for information. On the one hand, the citizen does not want the computer to act as a multi-headed probe into his private life.

On the other hand, is the growing awareness of the citizen that governments keep secret data on which they base policy, information amassed at the expense of the taxpayer's pocket. Should not the citizen have access to government databases?

Britain's Prestel viewdata service, was discussed as a higher level of data sharing, allowing remate, intelligent access showing that "standard" specifications must not be so rigid that they cannot accommodate new views and new hardware on a building block basis.

The question of staff support for parliamentary DP led to the question af the way in which equipment shauld be available and how it should be operated.

Sitting at the Raund Table in Strasbourg were men and women wha had accepted DP during the course of their jobs as a tool of their trade. None appeared to have spent all their lives in DP. In the Italian parliament, computer projects were launched in 1969, while Germany had started a year earlier.

The UK had taken until 1976 to approve the use of computers, but Belgium and the Netherlands are still in the "talk" phase.

It was clear throughout the conference that delegates were already aware of the vast opportunities which new computer based business systems were going to open up.

Whereas the electronic voting system of Italy gives a fast result to a voting question, British MPs would probably be reluctant to relinquish the voting lobby system because of the invaluable opportunities this method gives them to meet each other and transact political business.

The good news from Strasbourg was that Europe has hundreds of data networks. The bad new news was that nobody before had tried to put them together as a coherent access lattice.

At the conference, Alex Tomberg revealed, as vice-chairman of the European Association of Scientific Dissemination Centres, just how the centres were scattered round Europe like formed spiders. London and Paris competed with each other to be "on-line" with more networks than the other. What is now needed were simple, trans frontier links between, say, the legislatures of Bern, London and Madrid without crossing the Atlantic to do and probably losing privacy en route.

This was the end of the beginning in Strasbourg. What a function for big parliaments could serve every layer of province, county and borough government tier below. If a constituency borough council in Hastings wants to find out the procedure for development loans, expenditure versus budget to date on such loans and who is on the relevant committee then the systems discussed at Strasbourg should bring the data to the council at the tap of a button before 1984.

It's got to be before the George Orwell set that apt deadline of our civilisation. Since he wrote the book things have changed. Now I see the computer leaving "Big Brother" and moving to the side of the citizen — as long as MPs get moving.

R-range Facts

Hardware

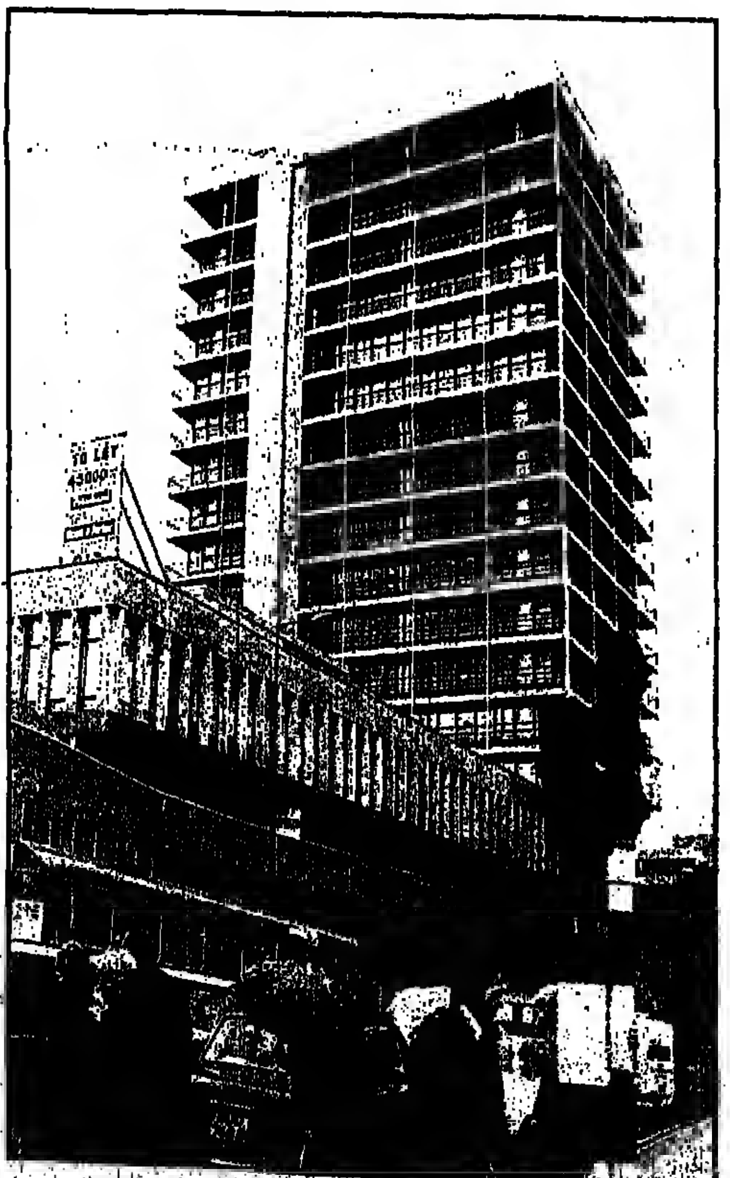
R100	8 terminal data entry and distributed data processing system
R300	20 terminal data entry and distributed data processing system
R400	48 terminal data entry and distributed data processing system
R550	30 terminal mixed media data entry system
R830	8 micro terminal distributed data processing system
R850	24 micro terminal distributed data processing system

Software	R100	R300	R400	R550	R830	R850
Multi-Tasking Operating System	●	●	●	●	●	●
Virtual Memory	●	●	●	●	●	●
Virtual Terminal Operation	●	●	●	●	●	●
COBOL – like Application Language	●	●	●	●	●	●
Formal Language	●	●	●	●	●	●
Inter-active Program Development	●	●	●	●	●	●
Test Editing					●	●
Systems Log	●	●	●	●	●	●
Operator Statistics	●	●	●	●	●	●
Re-entrant Code	●	●	●	●	●	●
Stack Processing	●	●	●	●	●	●
Independence of Data & Code	●	●	●	●	●	●
Structured Data Sets	●	●			●	●
Multi-level Indices	●	●			●	●
Multi-level System Security	●	●	●	●	●	●
Command Sequence	●	●	●	●	●	●
Data Entry Software	●	●	●	●		
Distributed Data Processing Software	●	●			●	●
Dynamic Disk Management	●	●	●	●	●	●
Seek Optimisation	●	●	●	●	●	●
Full Range of Utilities	●	●	●	●	●	●

Data Communications	R100	R300	R400	R550	R830	R850
Burroughs TC 3500	●	●	●	●	●	●
Burroughs TD 830					●	●
IBM 2780/3780/3741	●	●	●	●	●	●
IBM 3270					●	●
HASP RJE			●			
SDLC	●	●	●	●	●	●
ICL 7020	●	●	●	●	●	●
ICL 7502/3	●	●	●	●	●	●
ICL 7181					●	●
Redifon Synchronous	●	●	●	●	●	●
Redifon Asynchronous	●	●	●	●	●	●
Univac 1004	●	●	●	●	●	●

Yesterday's branch office

Today's



Branch office of the future, but available now that's the Model 745 Portable, from the 'Silent 700' series of electronic data terminals. It gives representatives immediate access to computerised data wherever there's a telephone and power point.

Just plug it in, link it to a 'phone handset and the 745 is ready to send or receive up to the minute data. You can then make instant decisions based on reliable, accurate information.

In your customers' offices, for instance, the 745 can enter sales orders or print out complete reports in seconds on your stock, delivery times, prices or detailed quotations.

You can buy the 745 at attractive prices, or use our flexible leasing programme. And you can depend on responsive support from TI's national sales force... with additional back-up from its distributor, TI Supply, to handle small quantity immediate deliveries.

The 745 means change... to greater efficiency and profit. Learn more. Call the nearest TI office, or complete the panel and send it now.

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SILENT 700
electronic data terminals

The 745 Portable Data Terminal
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OP SPOT

By Bernard Allen

Government must take the lead

"ALL of us employed in the computer industry should keep abreast of all developments and proposed new technology. Everyone should contribute something towards helping the industry over its present difficulties."

So writes Andy Foers, a senior operator with British Aerospace at Kingston-Upon-Thames in Surrey, and a regular contributor to Op Spot.

Prompted by a meeting on the future impact of computing and related technologies, staged by the British chapter of the ACM — the American equivalent of the BCS — Foers puts forward some of his views on the state of the UK computer industry.

He criticises the Government for failing to give stronger directives and calls for more direct investment in computing.

Says Foers, "It should be the Government that shoulders the responsibility by giving the lead to orderly, planned technological development — bearing in mind international developments."

Commenting on the proposed information technology commission (CW, April 20) he says, "I cannot agree that such a body should not be bureaucratic. I would suggest that the new commission should have substantial Government backing and, in fact, be given certain statutory powers to carry out its policies."

In order to save a lot of time, money and effort, more communication should take place between manufacturers and users, says Foers.

"Too little liaison and cooperation between users and the major manufacturers means an inefficient use of resources. Many basic problems, particularly in the fields of operating system language and communications, could be solved far more quickly with a greater interchange of information."

He continues with suggestions for the planning and coordination within the UK of the technology necessary for the computer industry.

Firstly, the Government must have a far greater influence on technological development in the UK. To do this it must:

1) Form a commission and give it the necessary powers to control development and coordinate policies.
2) Provide more direct investment.
3) Set up a computer industry training board.

Secondly, manufacturers should co-operate more with users. They should also:

1) Arrange less restrictive sales contracts in return for product testing and reporting.
2) Make basic technical information more readily available to people within the industry.
3) As a means of educating the general public, publish details about technological development more widely.
4) Aid the government in the provision of more training schemes.

Foers ... government should have a far greater influence on technological development in the UK.

Thirdly, users should form themselves into more powerful groups by:

1) Becoming involved with commercial and private user groups.
2) Acknowledging a professional body such as the BCS, which could set acceptable standards particularly in the fields of training and education.

HINT OF THE WEEK

Economising on printout and control statements

THE IBM OS environment is the subject of two hints sent by Eric Murphy, who is a member of the operations support team at the Manchester site of Barclays Bank.

The first is in response to a previous Op Spot hint which discussed modifying the OS pseudo-writer, SCRAPIT, in order to erase unwanted output (CW, May 18).

He says, "I feel that modifying Scrapit is a very dangerous procedure because it is all too easy to overlook a job for which output is actually required, or to forget to remodify SCRAPIT.

"The correct procedure is to reset the output class of the unwanted printout to Z. This may appear to be laborious, but can save the extra work and embarrassment caused by re-running jobs for 'lost' output."

His second hint is a "useful dodge" which may be applied when using the IBM utility IEBPTPCH to print one member of SYS1.PROCLIB.

He says, "To save coding three control statements, include the name of the MEMBER concerned in the SYSUT1 DD statement and use one control card with PUNCH on it. In addition, ensure that SYSUT2 points to an output writer class."

He gives the following example:

```
//PRINT JOB 1,CLASS=B
//S1 EXEC PGM=IEBPTPCH
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD DSN=SYS1.PROCLIB(MEMBA),DISP=SHR
//SYSIN DD*
  PUNCH
/*
```

Better terms at British Aerospace

OPERATORS at British Aerospace in Preston have been awarded improved terms of employment following negotiations between APEX, their union, and the company.

The new terms are worth between £5 and £6 per week more for each of the 35 operators, and APEX North-West area organiser John Wall described them as a "very significant improvement over previous conditions and payments."

The terms are effective from May 3, and the main areas of improvement are:

Firstly, the operators now get time and a quarter for staggering their lunch breaks, which have been extended to 45 minutes.

Secondly, all calculations for holiday and sick pay are now based on a 44-hour week, rather than the 36 hours actually worked. Operators had said that their earnings dropped when they were off work, due to losses in shift and overtime pay.

Thirdly, overtime is now worked by mutual consent, rather than on a compulsory basis.

Finally, the company has agreed to pay 30p for each shift worked when no canteen facilities are available.

DP's 'poor relations'

MANY operators are tired of being treated as the poor relations of the computer industry — that message is clear from the staff who have contacted me over the past few weeks.

It is in this context that Mr Patterson, a senior operator from London writes to Op Spot. He gives two examples of his experience in the matter.

Patterson says that he contacted a well-known bureau in an attempt to obtain literature on some new operating systems. As soon as he mentioned that he is a senior operator the person at the bureau completely lost interest in the conversation. Since then he has heard nothing further about the matter.

On training, he says that he is not sent on any courses and is at present trying to rectify this situation. He believes that the attitude of operations and DP managers towards operator training is extremely detrimental to operations as a whole.

Practical and theoretical

WHY study computer operations? The answer is that in the future more new jobs will be available in the area of computer operations than in the other functional areas — systems design and programming, according to a book published by Science Research Associates and called Computer Operations Procedures and Management.

Comprehensive, and quite readable, the text relates to both the practical and theoretical matters of operations. To aid study, each chapter is preceded by a series of questions, includes review questions and is followed by a glossary of terms.

Computer Operations Procedures and Management, 476pp. Global Book Resources Ltd, 109 Great Russell Street, London WC1. £9.75.

Opcomm wants your opinions

OPINIONS on current projects are sought by Opcomm, which is carrying out a study on operator training and is also looking into the effect of shift work (Op Spot, April 27).

All communication on these matters should be directed to Mike Rees, Flat 1, 1 Broadway Mansions, Broadway, Earlsdon, Coventry CV5 6NR, West Midlands.

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

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Puts the computers where the people are.

The R-range computers are small, powerful and economical – and they are located where the people who do the work are.

Which makes a lot of sense. Purely local work – like stock-control, enquiry, invoicing and so on – can be carried out on the spot. At the same time, all the data can be fed to a central computer to provide overall management information. It means that the whole system is simpler and more flexible, and that you're less at the mercy of a single computer.

Of course, a distributed data processing system has got to be simple and reliable. The people who will be using it won't be computer specialists – they'll be accounts clerks, department managers, secretaries and warehousemen.

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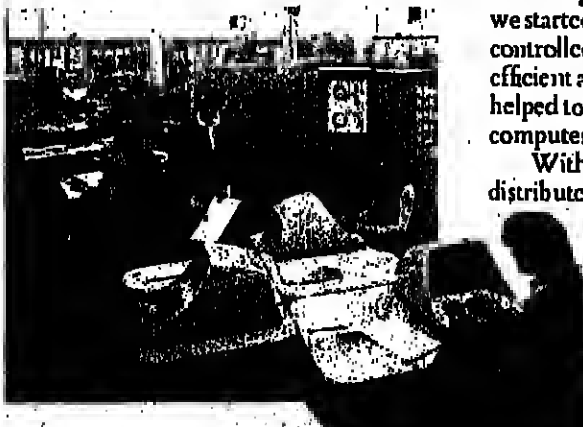

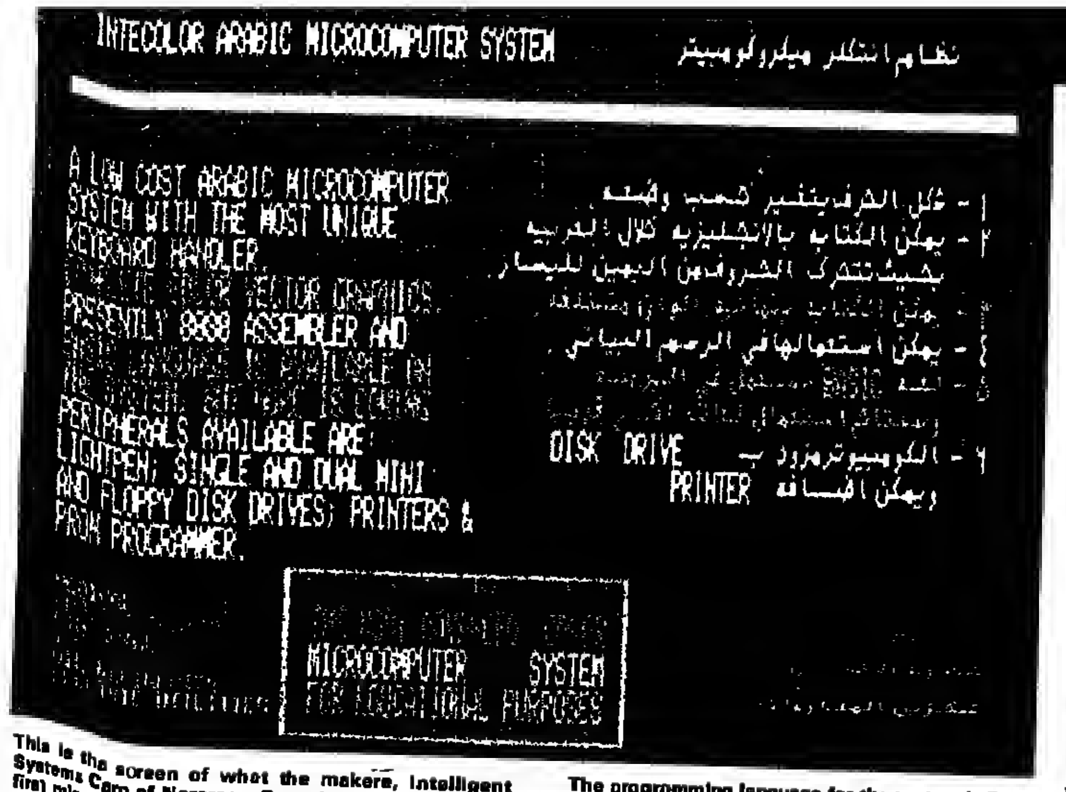

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A LOW COST ARABIC MICROCOMPUTER SYSTEM WITH THE MOST UNIQUE KEYBOARD HANDLER.
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PRESENTLY 8080 ASSEMBLER AND [illegible] IS AVAILABLE IN [illegible]
PERIPHERALS AVAILABLE ARE: LIGHTPEN; SINGLE AND DUAL MINI AND FLOPPY DISK DRIVES; PRINTERS & PROM PROGRAMMER.

١ - كل الحروف تتغير حسب وضعه
٢ - يمكن الكتابة بالانجليزية كل العربية بحيث تتحرك الحروف من اليمين لليسار
٣ - [illegible]
٤ - يمكن استعمالها في الرسم البياني
٥ - [illegible] BASIC [illegible]
٦ - الكومبيوتر مزود ب DISK DRIVE ويمكن اضافة PRINTER

MICROCOMPUTER SYSTEM FOR EDUCATIONAL PURPOSES

This is the screen of what the makers, Intelligent Systems Corp of Norcross, Georgia, US, claims is the first microcomputer system capable of generating all input-output statements in Arabic, Farsi or English.

It is being aimed primarily at the growing number of small businesses in the Middle East, and applications packages in Arabic for accounting, general ledger, and inventory have already been prepared. It does, however, have considerable scope as an intelligent terminal for a host computer, and in education.

The programming language for the system is Basic, but all I/O statements can be made in the native language. The system can cope with the different directions of writing of the characters, and English, Arabic and Farsi numerals can be inter-mixed.

Standard features of the system include a mini floppy disc drive, disc operating system, color graphics software, RS232-C communications interface, selectable baud rates up to 9600 baud, 19K bytes of RAM and 22K bytes of ROM that contains the software.

Intel extends its MCS-48 range

A SECOND addition to the low cost end of Intel's MCS-48 microcontroller product family is about to be launched in the UK. The device is the 8022, a variation of the recently introduced 8021, that includes an analogue to digital converter and variable threshold input channels on-chip. These latter allow direct working with touch panel inputs.

It is believed that the device may be given a preview at this week's Intel Fair, being held tomorrow, Friday at the Wembley Conference Centre in London.

Mounted in a 40-pin package, the 8022 incorporates several of the features of the 8021, 8-bit part, having an instruction set of 65-an on-chip clock, 64 bytes of RAM, 8 registers, 2 pointers and a single 5 volt power supply. It differs from its predecessor by doubling the amount of ROM available from 1K to 2K bytes and by the addition of the new I/O channel and the A/D converter.

The I/O is made up of the variable threshold input channels and open drain outputs. These can be configured to meet a variety of requirements, especially that of working directly with touch panel keyboard inputs.

The A/D converter uses two multiplexed analogue inputs, and can produce a conversion of 8-bits accuracy in 40 microseconds.

Although no official information on its price is available, sources indicate that it is being aimed squarely at the low-cost controller market.

If the 8022 is disclosed at the company's Fair, it will join a wide range of new product releases being made by Intel at this juncture. In addition to the 8086, 16 bit microprocessor, which will be getting its "official" launch at the Fair, the company has several new peripheral and memory chips to introduce.

Among these will be two high density ROMs, known as the 2332 and 2364. The former is a 32K bit device organised as 4096 by 8 bits, while the latter is 64K bits, organised as 8192 by 8 bits. Both use a single 5 volt power supply, and operate at a maximum access time of 300 nanoseconds.

Both are edge-enabled devices with static memory cells and clocked periperal circuitry. The edge-enabling provides a faster access time than fully static operation, and has the added benefit of lower power dissipation.

Tickets for the Intel Fair will be on sale at the door at Wembley, if the 600-capacity limit is not reached before the event.

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[illegible]

COMIC cuts cost and design time

FOR companies contemplating the possibility of requiring custom designed integrated circuits in a planned system, and also looking at the £50,000 plus price tag and a nine month design cycle normally involved in this process, a new design system has been made available by Hughes Microelectronics that can significantly cut both these items — if the circuit needed can be designed in standard metal gate CMOS technology.

The system is known as Customer Organised MOS Integrated Circuits or COMIC. The company, a UK subsidiary of the US Hughes Aircraft company, claims that both design time and cost can be cut by up to 70% by using it. The system, developed over a period of time by the company to assist its own operations as a custom design house, is now being offered generally.

The basis of the system is a catalogue of a wide range of CMOS cell structures and their respective logic functions. To design a new circuit, a job that requires no special knowledge of semi conductor design or technology, an engineer selects the cells required on the basis of their logic function, and interconnects them in the same way as a logic diagram. This data is then fed into a computer, the cells by a reference number and the interconnection by digitising, and the result is a tape suitable for the normal mask making process.

One advantage, stemming from an interest in the development of the system by the Ministry of Defence, is that the tape or masks can then be used to produce second-sourced devices at any facility capable of processing metal gate CMOS devices.

ROYTRON™
plug-compatible reader/punch

Desktop combination reader/punch with serial asynchronous RS-232C compatible interface. Designed to operate with a terminal device on the same serial data lines or alone on a dedicated serial line.
Reader will generate data at all standard baud rates up to 2400 baud.
Punch accepts data at all standard baud rates up to 600 baud continuous or 4800 baud batch, utilizing a 32 character buffer.
Two modes of operation are provided: *Auto Mode* — Simulates Model ASR 33 Teletype using ASCII defined data codes (DC 1, 2, 3 and 4) to activate/deactivate the reader or punch; *Manual Mode* — Code transparent mode. Panel switches control activation/deactivation of reader or punch and associated terminal device.
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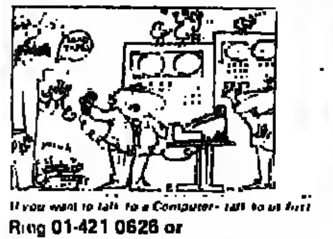

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Life at the top

THE chairman of IBM, Frank Cary, is the highest paid computer executive according to a survey in the US magazine Business Week.

Cary was paid $870,000 in 1977, up from $596,000 in 1976. IBM's president, John Opel, collected $490,000 in 1977 compared with $444,000 in 1976.

NCR's chairman, William Anderson earned $345,000 in 1977, a rise from his 1976 pay of $305,000. NCR president Charles Exley got $222,000 in 1977.

At Honeywell, chairman Stephen Keating took home $300,000 last year, up from $291,000 in 1976. Honeywell's president, Edson Spencer, was paid $425,000 for his efforts in 1977, a $50,000 jump.

Burroughs' outgoing chairman, Ray MacDonald, had a salary for 1977 of $550,000. In 1976 he got $525,000. Paul Mirabito, the company's new chairman, who served as president in 1977, got $423,000 and earned $370,000 in 1976.

Control Data's chairman William Norris earned $349,000 in 1977, up from $285,000 in 1976. Senior vice president Robert Price made $284,000 in '77, compared with $202,000 in 1976.

Airmen tried to hide $821m system

THE US Air Force defied Congressional instructions to halt a multi-million dollar computer management project and concealed its defiance for more than two years. That was the finding of a year-long investigation into the matter by the General Accounting Office.

At budget hearings in December, 1975, Congress directed the USAF to terminate its $821 million advanced logistics system (ALS) project because serious planning and operational problems were being encountered.

Until long-range requirements were assessed and a detailed implementation plan was presented to congressional overseers, Congress said that the USAF could continue only with "mission essential" projects for computerised logistics support.

According to the GAO's recently completed audit, the USAF spent $7 million between December, 1975 and October, 1977 for systems modifications, major redesigns and new systems development, all of which had been ordered cancelled.

One new system development project, called Project Max, was designed to track aircraft maintenance activities. Project Max was, the GAO pointed out, clearly in violation of the congressional directive.

Moreover, the GAO sleuths uncovered a USAF plan to spend an additional $54 million for new DP equipment. Of that total $10 million was to be spent to acquire, on a competitive basis, data capture equipment gear for the project.

The remaining $44 million was to be spent to acquire, non-competitively, six IBM 370/168s to replace the IBM 7080s and 360/40s. As a result of its probe, both these proposals were stopped.

How did the US Air Force plan to get away with the scheme? Since Congress had not specifically defined the "mission essential" phrase, GAO concluded, the USAF took the liberty of adopting a broad interpretation of the term, and one which encompassed almost the entire ALS project.

"In our opinion," GAO reported, "the Air Force's definition [of mission essential] was not a reasonable interpretation of the congressional guidance." The USAF had provided no constraining criteria in determining what was essential, either.

At the same time GAO criticised Congress for "appropriating lump sum amounts to the USAF without restricting what can be done with those funds".

Furthermore, GAO complained, Congress did not include any limitations on expenditures or definitions of "mission essential" in the 1975 US Appropriations Act, the document which would have made the directive legally binding. "Consequently," GAO concluded, "the failure of the USAF to conform with congressional instructions does not constitute a violation of any legal requirement."

Series 1 interface for Swift banking network

AN interface for the Swift international banking network is being developed by BIS Software using the IBM Series 1 minicomputer.

BIS already has a team of four working on a Chips, Clearing House Interbank Payments System, implementation on Series 1 in New York, and the Swift implementation is a logical extension of BIS services to the banking market. There are two customers for the Chips system, but as yet none for Swift, although several banks have shown interest.

Over 40 BIS Midas foreign exchange systems have been installed or are on order, including 10 in the US.

Series 1 was chosen because BIS does a lot of work on IBM hardware, and also because many of its banking customers are major IBM users. It already has foreign exchange packages developed for IBM's System 32 and System 34 machines, and banks would like to interface these to Swift. It is not possible to do so direct, but could be done through a Series 1 interface to the international network.

BIS hopes to be able to use the standard IBM Series 1 RPS real time programming system plus other programmable operating subsystems offered by IBM, and expects to program the Swift interface using Series 1 assembler.

Racal-Milgo in airline deal

A MAJOR contract has been awarded to Racal-Milgo by Eastern Airlines in the US. The order involves one of Racal-Milgo's new System 200 Network Management Systems, a Digital Equipment PDP-11-based advanced version of the System 180 announced in the UK last year (CW, October 13, 1977). It also includes 300 24 LSI modems and 38 96 MM modems and is required as part of a major enhancement to Eastern's US-wide seat reservation system.

Siemens' launch rival to E-series

THE answer from Siemens to IBM's forthcoming E-series (CW, April 27), has now been formally announced. Two models, the 7.708 and the 7.718, are claimed to offer the high power, low cost and ease of use which are expected to be features of the forthcoming IBM systems.

The Siemens machines are built into desk units, but have the throughput and memory capacity of a mainframe, and the BS-2000 operating system has been specially extended to enable the machines to be used by untrained staff.

The 7.708 has a basic 384 bytes of 16-bit RAM main memory, expandable in 128K-byte steps to one Megabyte. The 7.716 starts at 512K bytes and expands to 1.5 Megabytes, which is 50% more memory than IBM offers on the 370/138.

Prices start at 10,500 Marks, about £2,700 a month, implying purchase prices starting at about the £100,000 level. Deliveries begin in a year's time.

Meanwhile, the Hitachi M-210 which is shortly to be added to the Itel catalogue, is claimed to be considerably more powerful than Fujitsu's M-200 multiprocessor mainframe. Itel calls the machine the AS/7, and it gives the IBM-plug-compatible mainframe specialist what must surely be the most powerful general purpose computer in the world.

Latest Level 6s show Honeywell's mini commitment

THE introduction, six months ahead of schedule, of two further models in its Level 6 minicomputer line gives some indication of Honeywell's strong commitment to this important sector of the computer market.

Confirming this commitment, Jim Pompa, general manager of Honeywell's Small and Medium Information Systems Division, said, "We are investing more in research and development in a single minicomputer line than any other manufacturer and more overall than Data General. And that does not include investment in disc technology which is being done by Magnetic Peripherals Inc."

MPI is 70% owned by Control Data and 30% by Honeywell and CII-Honeywell Bull.

The two latest minis are the 6/23, a low-cost re-implementation of the basic Level 6 processor using four of the versatile four-bit Advance Micro Devices 2901 bit slice microprocessors and the 6/57, a top-of-the-line model aimed at the high throughput commercial user programming primarily in Cobol.

The 6/23 costs $13,500 for a 32K word machine with a single diskette, VDU and the new MOD-200 executive for the ECOS-6 operating system. The 6/57 starts at $127,000 for a 128 Kword system with 67 Mbytes of disc storage, tape deck, console and VDU. The 6/57 uses the MOD-600 executive.

Pompa pointed out that the 6/23 approximately covers the power range from the Digital Equipment PDP-11/03 to the 11/34, and the rest of the line extends to the 11/70.

The MOD-200 version of the executive is designed for use mainly with the 6/23 and the larger 6/33. It is backed by floppy discs only and the number of users is to some extent limited by the capacity of the floppies. This limit is at present four 500 Kbyte drives.

As well as being the headquarters of the Small to Medium Information Systems Division, Billerica is the site of Honeywell's Advanced Manufacturing Development Centre which played an important part in the success of the mini products.

Whenever it is decided to try to add new technology to existing models or to introduce a new model, the first 20 or 30 are built at Billerica where everything but raw boards is manufactured.

The design engineer for the product follows it closely through the manufacturing process where design improvements for cheaper and faster production are identified and used.

Industry surveys have put Honeywell in fourth place in the general purpose minicomputer market behind Digital Equipment, Hewlett-Packard and Data General. "But our annual business is running at about $250 million which puts us close to Data General and I believe we are growing faster," declared Pompa.

What of the future? Honeywell does not at present offer real time software on Level 6 "though some of our users are developing real time applications."

Variety is the spice of life

THREE ICL computers have found diverse applications in the US, ranging from the maintenance of a medical information database for over 1,500 doctors throughout the country, to handling accounts and inventory control for a company that distributes machine tools by direct mail order.

The first system, an ICL 1500 series machine, is being used by Health Care Systems, a Minneapolis-based service bureau which handles all data capture of patient information and charges and payments records for the 1,500 doctors.

HCS updates and maintains the software on the system for each client on an individual basis and almost three-quarters of the bureau's total input is via the ICL 1500 equipment. This features 33 ICL 1501 terminals and 13 ICL 1535 communications adaptors in a remote batch network linked into IBM 2780 and 3780 emulators. Over 200 clinics enter data either directly into an on-site 1501 terminal or submit it to HCS's central bureau for processing there.

Behring International, of Edison, New Jersey, is using an ICL 2903 to smooth out the handling of the import/export documentation generated by its freighting activities in the construction, heavy machinery and electronics and communications industries.

The 2903 system has 32K of main memory, two EDS 60 disc drives, one fixed, one exchangeable disc drive, six direct data entry stations, two model 7184 VDUs and a 600 lpm printer.

Finally, Reid Tool of Muskegon, Michigan, one of the first ICL System Ten 220 Series users, claims that the system has enabled it to increase work throughput by almost a third.

Originally, Reid Tool just had an ICL System Ten Model 21, which now maintains the company's customer mailing lists — a job that previously went to outside bureaux, but the new 220 Series processor, using software supplied by Central Data Systems of Detroit, handles order, accounts and inventory control.

Data encryption on single chip

A SINGLE-CHIP data encryption unit that meets the standards set out by the American National Bureau of Standards has been introduced by Intel.

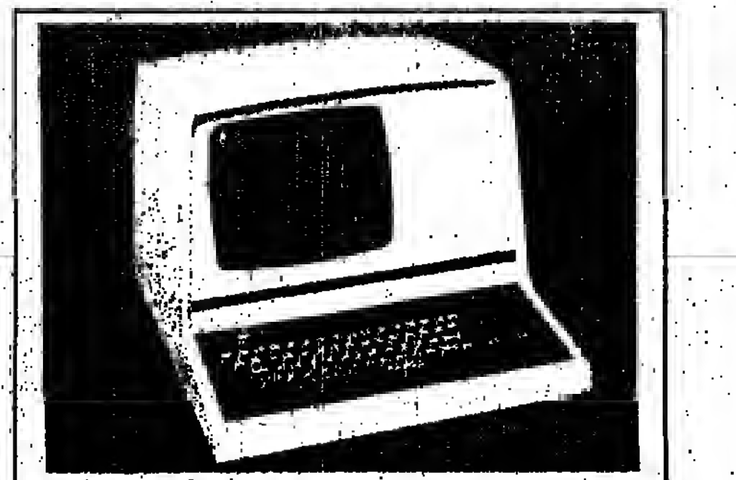
Known as the 8294, the device provides up to $2^{56}-1$ different ways of encoding data, a figure achieved by coding and decoding 64-bit blocks of data in accordance with a 56-bit user specified key, to produce 64 bit cipher words. The same key is used at each end of the link.

The part has been designed to act as a peripheral chip in a processing system, and both the 56-bit key and the 64-bit message are transferred to the 8294 over the system bus, one byte at a time.

Land of the rising micro

ANOTHER Japanese company is planning to enter the microprocessor market. Oki Electric Industry is to launch a 4-bit, single chip CMOS microcomputer called the OLMS-40 Series.

Deliveries of the part are scheduled to start in August, and the company is said to have already received several orders for it.



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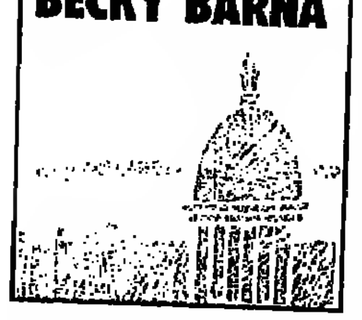

Basic human right of free flow of international data

WHILE many governments are hurrying to adopt positions on the issue of transborder data flows, the United States is to continue its go-slow approach to the matter, a White House official has announced. "The Carter Administration does not see an economic war ensuing if Europe passes laws restricting transborder data flows," said Richard Neustadt, a member of the White House Domestic Policy Staff.

Speaking at a meeting of information policy officials in Washington, convened by the Data Processing Management Association, Neustadt said the data flow dilemma involved philosophical as well as economic implications. "This Administration feels that the free flow of information is desirable as a basic human right," he added. "However, it is becoming harder and harder to sustain that philosophy."

Art Bushkin, a staff member in charge of information policy at the new National Telecommunications and Information Administration, said NTIA was in the process of studying the economic implications of the transborder matter. Initial study results indicated that the macro-economic impact on the US from data flow constraints imposed by other countries "would be minimal, or less than one-hundredth of one per cent of the gross national product."

According to the NTIA spokesman, the key economic question was how much American information economy flowed out of the country in the form of exports. "It turns out that it is a very small amount," Bushkin said. "So trade barriers set up by other countries would have little impact on the US."

Bushkin admitted, however, that the internal structure of multi-national corporations "would be affected" by such constraints.

Both Bushkin and Neustadt emphasised that since the Administration has only scratched the surface of the issue, much more study will be required, and will be forthcoming, before national policy is adopted. "We will be activists in this area," Neustadt pledged.

Currently being drafted by the White House, in conjunction with NTIA, the Administration's privacy position is expected to be tougher on the public sector than on the private sector. "The Administration's philosophy favours marketplace regulation of the private sector," Neustadt stated. "We want to exercise minimum government control over private industry. On the other hand, the public sector requires a different approach."

Neustadt claimed the Carter Administration was now well on the way towards creating "a community involved in information policy."

Neustadt expressed confidence that the people and governing bodies necessary to develop national information policy were now in place.

RICHARD NEUSTADT . . . "Harder and harder to sustain that philosophy."

Call to link more buyers to sellers

A VAST computerised information system linking potential foreign buyers to likely suppliers in the United States could serve as an incentive for American companies to expand their export activities, Frank Weil, assistant secretary of commerce for industry and trade has suggested.

At the annual World Trade Conference in Chicago, Weil insisted the US must offer more export incentives if it hoped to hold a high place in the international economic order. "America must recognise, as do Germany and Japan, that to pay for our appetite for foreign goods, we must increase our exports," he added.

And to increase US export incentives America must adopt a national export policy, he said. "A national export policy should build on one of America's historic strengths — our long-time leadership in science and technology.

Our major successes in exporting have come in high technology areas such as telecommunications, computers, aircraft and electronic equipment."

Weil urged the US to "focus government support for research and development in ways that will lead to new products and vigorous marketing strategies suitable for export markets."

According to Weil the adoption of such a policy would also require a renewed look at America's anti-trust laws. "We need a serious examination of whether the anti-trust laws needlessly impair our ability to compete against industrial conglomerates abroad, conglomerates which often enjoy the blessings of their governments," he said.

As other areas the government should examine in the light of an increased need for exports, Weil cited America's tax system, inadequate Export-Import Bank resources, and environmental and safety regulations.

Carter sets up technology office

THE United States government has a new focal point for national telecommunications matters (CW, April 13). With the signing of an executive order, President Carter officially ushered in the National Telecommunications and Information administration, which resides in the Commerce Department. NTIA reflects the merger of the former White House Office of Telecommunications Policy with the Commerce Department's Office of Telecommunications.

President Carter also acted on the recommendation of commerce secretary Juanita Kreps by nominating Henry Geller to the new post of assistant secretary of commerce for communications and information. Formerly the general counsel to the Federal Communications Commission, Geller will head the new administration.

The drafting of a mandate for NTIA has been a source of controversy ever since the process began last year under the direction of the Office of Management and Budget. With a number of executive agencies competing for jurisdictional authority, the executive order underwent six revisions before the final form was adopted. The initial reaction in Washington to the resultant charter was dissatisfaction.

Although NTIA was to combine the functions of both the Office of Telecommunications Policy and the Office of Telecommunications, the new body does not even have as broad a charter as the now-defunct OTP. NTIA was thought to have the expanded scope of information as well as telecommunications. However, there is no mention in the NTIA charter of information policy.

For example, NTIA was expected to be in charge of setting policy on transnational data flow. But instead, that job has been given to the State department.

According to the executive order, NTIA will serve as "the President's principal adviser on telecommunications policies." Its duties include advising the Office of Management and Budget on procurement of federal telecommunications systems; studying and evaluating telecomm R&D; developing policies and programs relating to international telecomm conferences and negotiations; co-ordinating telecomm industry regulation and co-ordinating the White House with other interested agencies on various activities.

OMB is now in charge of advising the White House on most government telecommunications systems and for setting most national policies. The co-ordination of telecommunications facilities during national emergencies, formerly the job of OTP, is now to be done by President Carter with the advice of the National Security Council. NTIA may be invited by the State Department to get involved in some international telecommunications matters.

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Fujitsu-Siemens deal to test strength of IBM

LETTER FROM AMERICA

By Hesh Wiener

THE widely-publicised association of Japan's Fujitsu and Germany's Siemens may pose more of a threat to IBM than was first anticipated, according to various American sources. There are also indications that the agreement between Fujitsu and Siemens may serve as a model for other co-operative ventures among IBM's competitors and the leading computer manufacturers of Europe.

According to Charles P. Lecht, president of New York's Advanced Computer Techniques, IBM holds nearly 60% of the German market, while Siemens has about 20%. The rest of the German computer base is held by Univac, Honeywell and numerous small computer manufacturers such as Germany's fast-growing Nixdorf.

As Siemens begins to market the M-180/3 and M-200, as well as other IBM-compatible systems, the balance of market control could well tip away from IBM. And, with nearly all mainframes meeting or nearly meeting IBM standards, companies selling incompatible mainframes could suffer serious erosion of their markets.

The Fujitsu deal alone will not enable Siemens to match IBM across the full range of the 370 and 303X lines, but, according to Lecht: "You can be sure Siemens will conclude a deal with Amdahl. Between Fujitsu's 180/3 and 200 is a five MIPS (millions of instructions per second) gap, which can be filled by a version of the Amdahl V-6.

"If you consider the availability of smaller IBM-compatible processors, such as those offered by Magnusson, IBM's product range is covered from the 115 to the 3033 by competitive gear," he said.

The Fujitsu-Siemens pact has been outlined by P. Kobashi, Fujitsu's president. The proposed agreement includes Fujitsu's sale of M-180 and M-200 mainframes to Siemens, accompanied by unspecified technical support. The agreement is, reportedly, the conclusion of five years of negotiations.

In return, the Japanese will market Siemens laser printers, said to be the most advanced in the world. Sources indicate that an agreement by the Japanese to buy small systems, perhaps from Nixdorf will also be signed so that the trade balance between Germany and Japan is not suddenly tipped by the expected shipments of millions of dollars worth of Japanese mainframes to Germany.

Should Siemens offer a full line of products, similar to IBM, German government and private buyers will be able to retain their operating procedures while buying systems from a German-owned company. According to Lecht, nearly all mainframes now being sold in Germany which are in the 370/158 class and above are the product of American or US-owned companies.

Lecht believes there may be some difficulties for IBM users in Germany who plan to switch vendors. The Fujitsu operating system software differs from IBM's and it is believed that Siemens will also offer their own software. Only Amdahl machines, of those likely to be sold against IBM's own, enable users to run standard IBM programs without conversion.

Other EEC nations may adopt similar strategies, motivated by nationalism and the rising level of technological competence across Europe. France could well offer a range of mainframes beyond those now being built by Bull, and there are rumours in the US that talks between Japanese and French mainframe makers are under way.

There is a story making the rounds in New York that Philips and Univac are working on some kind of mainframe marketing arrangement, presumably including production and/or sale of the IBM-compatible Univac range in the Netherlands.

Cary defends sales to South Africa

THE question if IBM computer sales to governments that may use the machines for repressive purposes were once again raised at the annual general meeting of the company (CW, May 4).

IBM's adversary in this dispute, as in the past, is the National Council of Churches of Christ, and its associates, America's largest Protestant organisation.

Led by Dr Howard Schomer of the United Church of Christ and backed by several thousand proxies, the churchmen alleged that IBM's computers were being used improperly and asked the corporation to investigate various allegations and to make the results of the study available to all interested parties.

Dr HOWARD SCHOMER . . . Led the churchmen in their protests.

IBM's chairman, Frank Cary, reiterated his statement, made at last year's meeting, that "IBM would not bid any business where we believe our products are going to be used for repressive purposes."

Shareholders at the meeting pointed out that IBM was continuing its support of systems used by the South African police and military, which Cary defended as an action within the guidelines set up by the US State Department.

Asked by Dr Schomer whether IBM had ever refused to sell a computer because of possible human rights violations, Cary said the company had, but would not provide details of that refusal.

At a previous meeting between church representatives and IBM executives, Cary defended computer sales to South Africa, saying that the US government was not cutting off the flow of computers to South Africa because of the way the machines were being used but because the refusal to supply material to the regime in general was a way to put pressure on the government there.

Cary also said that accusations in the press about IBM's sale of computers to the police and military of Argentina, Brazil, Chile and Uruguay were not accurate, but he did not answer general questions about the company's installations in those regimes. IBM denied reports presented by the churchmen that described systems allegedly being rented to the intelligence arm of the Argentine navy for use in police activities.

Representatives of the church groups, however, are confident that their intelligence is accurate. It is believed that the religious leaders have in their possession an affidavit from an Argentina who saw the actual systems and investigated the facts behind how they reached the Argentine navy.

While the church resolution was defeated, there were six million abstentions.

Story on Honeywell is criticised by newsletter

AMERICA'S computer industry has several small newsletters devoted to specialised interests. One of the fastest-growing is Computer Marketing Newsletter, which covers the industry from the viewpoint of a sales expert.

During the past months the report has published the sales compensation plans of Prime, Data General, Logical Machine Corp and other manufacturing firms.

And its May issue took Business Week to task for a cover story critical of Honeywell.

The defence of Honeywell specifically criticised the published story for its treatment of the 66/85 cancellation, claiming that a high-end system was, in fact, planned for 1979 and would be announced when Honeywell was sure it has a good product. Business Week's editors felt the Multics system should be marketed more aggressively, while CMN called the time sharing system the "King Kong" of such software and a diversion of marketing energy because it serves relatively new users' needs.

In an industry replete with the ghosts of GE, RCA and Xerox computer efforts, Honeywell's slim profits just might be a sign of health, the newsletter says, and not a sign of weakness. The publication does not, however, make any predictions about Honeywell's future.

Other items in the issue included a report that CDC had "thrown in the towel on pushing their Cyber 18 line as a general purpose product." The source is apparently someone who sat in on Control Data's Market planning meetings, which are supposed to be confidential.

Computer Marketing Newsletter is a monthly publication, and has just completed its first year.

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Transfer of funds controversy

WITH full knowledge that they were rushing headlong into a growing controversy, both the US Federal Reserve Board and the US Federal Deposit Insurance Corp. have adopted regulations which allow their member institutions to provide customers with automatic fund transfers from their deposit accounts to current accounts.

The separate, but similar, moves will allow the Fed's 5,700 member banks and FDIC's 9,000 commercial and mutual savings banks to offer customers the option of automatic funds movement from their interest-bearing savings accounts into their current accounts to avoid overdrafts.

This facility, in effect, provides for payment of interest on current accounts, a practice prohibited by federal law. The way in which it is being done, however, may fall within the legal framework, but the US League of Savings Associations plans to file suits against both organisations. It views the new rules as a competitive threat to the survival of its members.

There is more to NCC'78 than meets the casual eye

TIM PALMER previews the 1978 National Computer Conference to be held at Anaheim, US.

NOTHING is what it seems to be at Disneyland. Trees are made of wire and concrete; 360° panoramic films make an audience sway, rooted to an unmoving floor, with the photographed motion of a fire engine racing crazy through the streets of Washington; and the Mark Twain paddle steamer runs on underwater rails.

Disneyland is synonymous with Anaheim, and, basking in the Southern California sun, Anaheim is the home of the 1978 National Computer Conference.

At first sight, the NCC is simply the world's biggest annual showcase for the offerings of the US computer industry, with scores of major new products held back or brought forward for announcement at the show. With 1,382 display booths housing 330 companies, the display space is sold out.

With minis and micros, office computers, word processors, fast printers, slow printers, terminals, disc drives, tape units, bubble memories and IBM, NCC promises to be a huge exhibition. But NCC is more than an exhibition.

Most conference organisers would be more than satisfied with a four-day event which would bring in some 40,000 people from all over the world and attracting several hundred of them to many of the 100 sessions.

These sessions will include presentations by several of Japan's leading specialists, and should shed some light on fascinating new machines like the formidable Fujitsu M-200, which offers up to five times the power of the IBM 3033, and Hitachi's M-210, claimed to be even more powerful, and due to be added shortly, to the Intel catalogue as the AS/7.

Where IFIP frequently reaches for the lofty heights of the academe, with digital dreamers stepping down but momentarily from their castles in the sky, NCC '78 promises to concentrate on the down-to-earth, the everyday concerns of the harassed DP manager, beseiged in his very pregnable automated dugout.

Major themes of the conference will include applications, methodology, systems, and the thorny question of the impact of computers and society.

People who have suffered from a surfeit of academic pie in the sky will welcome the words of Dr Leonard Liu, co-chairman of the technical and professional programme.

"As part of our emphasis on the practical and the useful," he says, "it is imperative that we hear more from those who use computer systems.

Not that the higher reaches of computing science are to be ignored altogether: far from it. Alongside such practical issues as electronic funds transfer and office automation, more esoteric topics such as artificial intelligence and simulation will be debated.

But NCC is more than a conference and an exhibition. Last year in Dallas, a tentative approach was made to provide an inkling into what the budding home and personal computer market was all about.

The Personal Computing Festival at NCC, enlivened by a competition featuring microprocessor systems and applications, is sure of a sell out success and over 100 organisations have booked space to promote their wares in anticipation of the hordes of hobbyists anxious to part with a roll or two of greenbacks in exchange for the latest teletype-compatible interface or Univac-1108-on-a-board.

Even the Personal Computing Festival is more than it seems, as 30 conference sessions will be devoted to the theory and practice of the art.

Keynote speaker at symposium

Richard M. Harden

A ONE-DAY technical symposium on the theme "Tools for improved computing in the 80s" will be held at the US National Bureau of Standards in Gaithersburg, Maryland on June 15. Richard Harden, President Carter's special assistant for information management, will give the keynote address on "Sharing information for decision-making in the federal government".

Apart from Harden's speech, there will be one other general session, on the state of the President's project to reorganise government DP. The rest of the day will be taken up by a number of parallel sessions, covering such issues as super computers, software engineering, programming languages, architecture, management issues, and optimisation tools.

The symposium is being organised jointly by the Washington chapter of the Association for Computing Machinery and the National Bureau of Standards.

Prestel wins plaudits in US

FIRST US sales by September of the Prestel viewdata information service, and joint British-US product developments to be launched next year, are spearheading the attack on the US market by Insac, the software and services subsidiary of the British National Enterprise Board.

The capability of Prestel to be interfaced with home computers and to distribute software are among the applications being considered in the US, in addition to Prestel's main use as an information service based on the domestic TV set.

Prestel in the UK begins official trial transmissions today, June 1, despite some teething problems.

Prestel sales in the US are likely to provide a boom for GEC as well as for the British Post Office, which developed the system, and Insac which is marketing it in the US.

At present, Prestel is implemented on GEC 4080 minicomputers and according to Sy Joffe, president of Insac Inc, US observers believe that there is no American mini that can handle Prestel as well as the 4080.

During the past two months Prestel has been demonstrated to over 50 US corporations and, according to Joffe, the response has been "ecstatic".

In addition to Prestel, Insac's main US activities are to market the software and expertise of its four member companies in each of which it has about a 25% stake — CAP, SPL, Systems Designers and Systime.

"We have decided to develop new products especially for the US market," said Frank Stephenson, president of Insac Group Inc. "Each member of the group is currently working on one major product in collaboration with US companies. These are in the communications, office products and computer equipment fields. These will be ready next year."

Move into Europe

HAVING already sold eleven packages in Europe, Northern Software Consultants has set up a European subsidiary and is acquiring an office in Cologne. It will market NSC's range of standard accounting packages which can be offered in German, Dutch, French and English versions.

CDC sued by shareholder

A LAW suit seeking payment of $1.7 million to Control Data Corp by some of its own top executives involved in the illegal transfer of money to bribe overseas officials (CW, May 11), has been filed by Arthur Abbey, a CDC shareholder with 75 shares. The defendants include CDC chairman, William Norris, vice chairman, William Keye, and executive vice-president, Robert Schmidt.

Abbey has also asked that the defendants be made to pay back benefits they have received such as stock options.

Solar mini based system

MANUFACTURE of the SEMS Solar 16/40 minicomputer by Calcomp has begun in [illegible]. The machines, built under licence from the French company, are to be incorporated in a new multi-terminal graphics system, the IGS-500. It will have the 32K-word mini with [illegible] Megabytes on disc and [illegible] workstation with integral [illegible] picture processor and two displays, one for alphanumeric work and the other for graphic work.

New appointment

THE general manager of Perkin-Elmer Data Systems and vice-president of Perkin-Elmer Inc in the US, Daniel [illegible], has resigned and has been replaced by William [illegible], who has been deputy general manager of Perkin-Elmer's instrumentation group, as general manager of [illegible] Elmer Data Systems.

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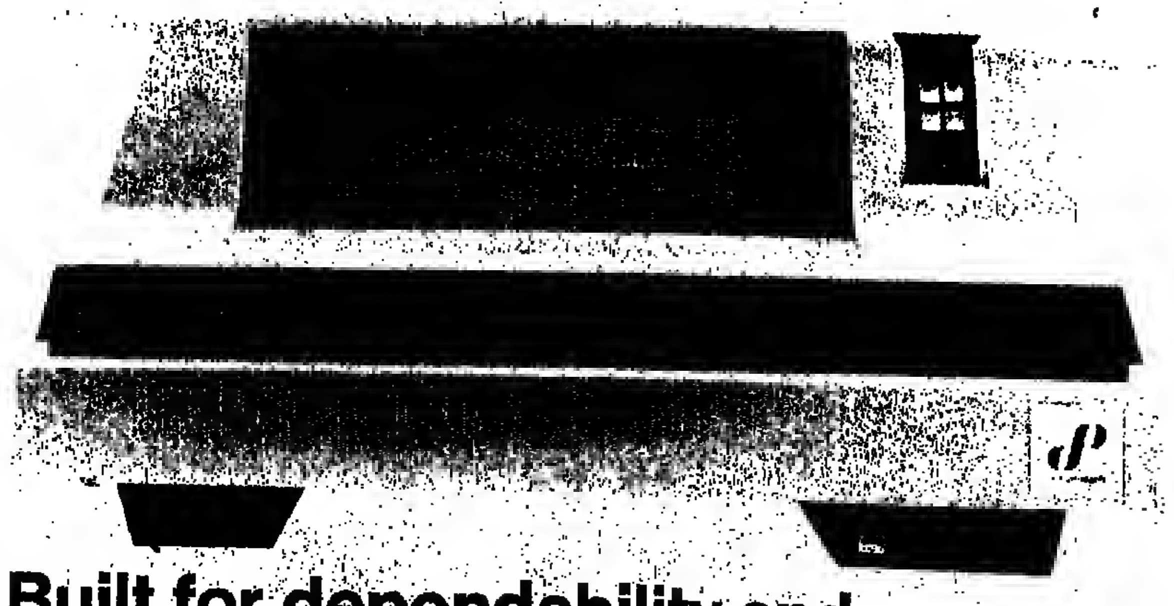

COGARVIEW

Why emulation will not spare the need for conversion

TYPICALLY, in a recent user survey, all the respondents labelled their operating systems either "good", "very good" or "fairly good". Yet when they were quizzed more closely, the same users — 70 per cent of whom had opted for "good" to describe their operating systems — unleashed a veritable barrage of complaints. The systems were too slow, they used too much core, they had too few partitions, they were weak on disc allocation, they were inflexible, their file security was faulty.

I have seen quite a few similar surveys, with an identically sudden turnabout by users upon follow-up in-depth questioning, over the years.

Are computer users intimidated then? Or are they fickle perhaps?

The conclusion rather is that a good operating system is one with the faults of which you can live, whereas a bad operating system is one that doesn't work at all. Small wonder none of the users in the above referred-to survey labelled their systems "bad". No doubt they would have long since been returned to the manufacturer.

The fact is, as any honest designer will admit, that operating systems are a black art. Maybe one in four comes close to achieving all that is claimed of them; the rest are more or less close approximations to what is needed, often eked out by user modifications because it is easier and probably cheaper to work on the aberrant software yourself — even at the price of introducing 10 new problems for every one put right — than to ask the manufacturer to do it for you.

Operating systems are, in fact, probably the weakest part of any computer system, and it is amazing to what extent users have become tolerant of software faults which, if they had a hardware equivalent, would send them raving mad and keep manufacturer's maintenance engineers in the field 24 hours a day.

In some cases, of course, the reason for this bovine patience is simple self-interest on the part of users' DPMs; through tinkering with the operating software to debug the debuggers and introduce individual quirks people cement their jobs, increase staff and influence vis-a-vis their employer.

It is thus a fact that IBM's tardiness with a replacement machine for the 168 created a general shortage of advanced programmers, while the announcement of the 3033 instantly foreshadowed a surfeit in this respect.

But if operating systems in general are a black art, emulation must be blacker still. The only reason I can imagine why users of first ICL 2900 big machines and now CII-Honeywell Level 64 and later Y4/5 systems are prepared to accept emulation as an integral part of their upgrade package is sheer relief that a compatible upgrade is available at all. In Europe at any rate, first-class operating systems seem to have been sacrificed to the need for merger rescue operations.

Operating systems are probably the weakest part of any computer system, and it is amazing to what extent users have become tolerant of software faults

Will it turn out to be a worthwhile compromise? I doubt it. No one has ever emulated successfully in terms of complex mainframe systems, unless you count Honeywell's Liberator system for conversion from the 1401 to the H200, and Liberator's "success" owed more to IBM's lateness in releasing the 360 than to any inherent qualities of the conversion software.

The problem is that emulation seems delightfully simple – especially when presented by glib salesmen to gullible, non-technical management fearful of the cost of re-programming and wondering whether they made an awful mistake when they opted for 1900 or System 4 or Iris or Unidata 7000 or Level 64 in the first place.

Even software men can become enthusiastic about emulation – at first. It all seems so easy until you get to that last 10 per cent where somehow nothing seems to go right. What usually happens, of course, is that at this point the manufacturer throws in his brightest software stars with a nod and a wink, and that last 10 per cent gets shoved into place by brute force, coupled with a bit of corner-cutting here and there to keep things looking tidy. Chances are the user won't stumble on this bit of window-dressing too early, and if he does, some sort of ad hoc solution will be thrashed out.

Unless a manufacturer completely uses up the instruction set when he designs a machine, and disallows all attempts at tinkering (East Germany's Robotron is one manufacturer treading this path) some programmer is eventually going to work out some short-cuts and stick flags into his program to counter any new obstructions his tinkering may have caused.

And as often as not such tinkering goes on without any documentation, and sometimes without leaving any path back to the original software, if things begin to go badly wrong.

No emulation system is going to be able to cope with these individual idiosyncracies, and it is one of those little paradoxes that if an emulation system is not 100 per cent effective, then it is scarcely effective at all.

But what's the alternative — a contribution to the reprogramming costs of every single user? As Siemens discovered, that can work out very expensive indeed; maybe £250,000 each time, or three times the original cost of the machine.

The inability to achieve full emulation is one disadvantage, and the time it takes to emulate is another, albeit the advent of microprocessors may offer some relief in the latter respect by speeding up things. But emulation is a slow process. It must lop at least 10 per cent off processing speed even when working at its best, a loss that must either be accepted by the hapless user or compensated for in excess computer power at excess cost.

That may not seem a very considerable problem in the early stages of an upgrade – when spare capacity is almost bound to be lying around – but when the spare capacity gets used up quicker than expected, it could be a headache.

If we have to accept emulation as a commercial necessity, let's be open about it. Let us admit that it is a compromise, a hybrid, and that compromises never work as well as the real thing and that hybrids usually produce unexpected problems.

Above all, let us not pretend that emulation is some kind of Tiger Balm – good for curing everything from lumbago to lung cancer. It is not a tremendous new invention of the '70s that has swept away all the old problems of upgrading from one machine to an incompatible other.

It is a technique that has been known for almost as long as computing has been around, and in the past, has always been rightly regarded with considerable caution – a last resort when the imagination fails to come up with a real solution.

And every salesman who has ever told a customer that emulation will spare him the need to do any reprogramming should be made to kneel and eat his own indigestible words.

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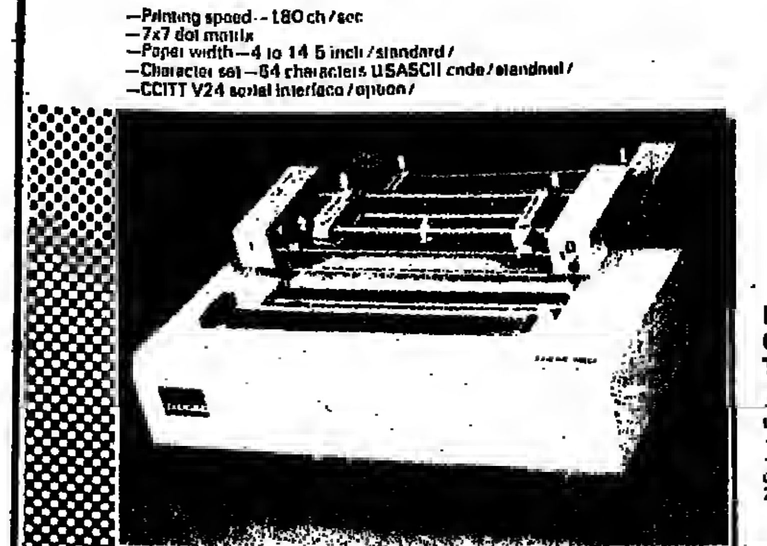

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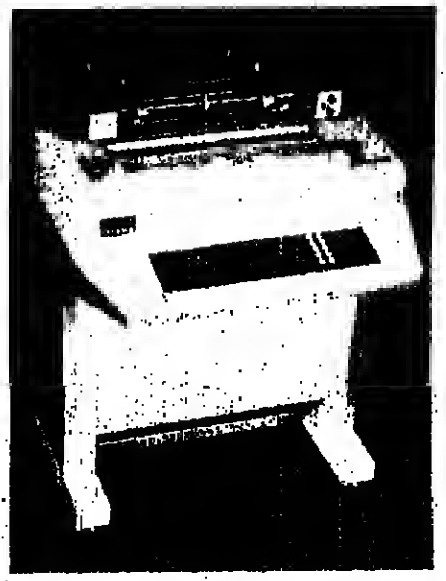

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Lecht, the man in a big glass-house, aims his brickbats in all directions

At 45, the wiry and frenetic Charles P. Lecht (known in the US computer business as Charley) has become one of America's most outspoken critics of the industry. And his best-selling book, The Waves of Change, has been followed up by another, entitled Tsunami. In it, Lecht (right) warns his country of "an emerging undertow which may siphon US technology offshore, only to return one day to swamp and neutralise the position of technological leadership America now holds."

YOU have no doubt heard about people who live in glass-houses. Well, Charles P. Lecht is one man who does not heed that old warning. Sitting cross-legged on the floor of his glass-domed, glass-walled New York City apartment, 250 feet above the busy streets, Lecht takes aim at every major American institution involved with the computer business, including the United States government.

"This government has been tremendously inactive in trying to straighten out technology during the last 10 years," he says at the apartment he keeps a few blocks away from his Madison Avenue office. The apartment is a glass-house with furnishings that include a computer system.

"I don't see that the US government has a master plan for protecting its technology," he continues. "But one thing I do see is inarguable data that shows an erosion of US technological leadership worldwide — not caused by chicanery in other countries but by a lack of planning within our own."

Lecht criticises computer users for being pawns of the more powerful manufacturers, manufacturers for being "shy" in convincing the country that technology is a national resource, and the Carter Administration for failing to formulate a national information policy.

"But you must understand," Lecht adds, "that I'm arguing for and not against this industry. I've mellowed a lot in the last few years, as I realised that things are imperfect everywhere else, too."

It is difficult to imagine Lecht mellowing. The 45-year-old philosopher is one of America's most outspoken — and until recently, least-known -- critics of the computer industry. His voice has been heard in the circles of those who control the business, for Lecht is someone who has earned the respect of his colleagues by rising through the ranks of the industry.

Lecht is founder, president and chairman of the board of Advanced Computer Techniques Corp. Over the past 17 years, he has built ACT from a one-man software consultancy into a 400-person international service complex. The company, with headquarters in New York City, derives over half its revenues, which last year reached $16 million, from operations in Europe, Canada and the Middle East.

By Becky Barna

Lecht's extensive travels have taught him, he says, that "to comprehend developments at home, we are compelled to look abroad for the fullest possible explanations." He hopes to detail those explanations he has gleaned in his forthcoming book, Tsunami.

Bolstered by the success of his most recent best-seller (among computer people), The Waves of Change, Lecht is enthusiastic about expanding his techno-economic analysis of the US industry into one that encompasses the world computer community. But he is less enthusiastic than interested in what he sees happening on the international scene.

As he warns America in Tsunami, there is "an emerging undertow which may siphon US technology offshore, only to return one day to swamp and neutralise the position of technological leadership America now holds."

Lecht expresses concern that the US is losing its lead in technology. As he sees it, the American industry is the hare; the slow but determined tortoise of the outside world is, as usual, being under-estimated.

According to Lecht's theory, the determining factor in world leadership is "the role of governments in guiding and nurturing their computer industries." At present, Lecht claims the US government is trailing others in that respect.

While US manufacturers abhor the thought of government intervention in their business, Lecht contends, it is that very intervention by other governments in their high technology industries "that supports them and accelerates their rate of improvement."

He says: "This country has been afraid to address the issue of technology as a national resource. Japan, however, has not been afraid at all. And yet, we (Americans) get angry with them because they are having such success.

"Indeed, the Japanese government has been able to co-ordinate its national policy of support for its computer industry so well that, by comparison, our government seems antagonistic to our own DP industry.

"I do not think it is planned, however. You would dignify what the US government is doing by calling it a plan. What it is doing is unplanned, and that is the problem.

"Some three dozen countries have a technology-guiding body that establishes information plans and policies. But not this country." Although there have been recent efforts to establish such a body in America, he calls the end result "a sham".

Lecht is referring to President Carter's creation of the new National Telecommunications and Information Administration with the Commerce Department. "NTIA is not a central force," says Lecht. "Every other federal agency wanted a piece of the pie -- and they got it. That defeats the purpose of a 'unified' body."

Lecht considers the move of the telecommunications office from the White House to the commerce department a demotion. "At least in the Ford Administration we had someone in our business in the White House, and now there is no one. And all of this as a result of creating an agency to help us? I think the US government is fooling around irresponsibly with our industry.

"We have to get our act together," Lecht warns. "Otherwise, the US will be very sorry, very soon. I believe the Eighties will bring an incredible change in the way we envision our political system in this country. During this period, I foresee a significant amount of national and international strife and disorder. One of the most potent means of containing that kind of catastrophe is through technology.

"Once we enter the realm of machines that switch in 10- second," he contends, "the potency of a computer system as a defensive weapon is going to exceed that of any kind of explosive device known to man.

"That is why I think the US ought to watch where it is shipping its technology. And it ought to see how it is becoming dependent on computer technology, too."

Perhaps Lecht's gloomy predictions are "drawn from a well of ignorance too eager to be tapped." But, he says, it is better to have unproven theories about the world than to have no theories at all.

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JEOL hit by pricing troubles

FIRST sign of a shake-out in the computer tomography scanner market is the virtual withdrawal of the Japanese company JEOL, which has given up marketing its scanner because of increasing price cutting.

JEOL's scanner, developed in collaboration with Chiba University and a subsidiary from the Japan Society for the Promotion of Industry, is claimed to be unique, having the first X-ray microbeam scanning systems in the world.

It was first priced at a then competitive 210 million yen. However, escalating competition in the lucrative scanner market has caused the average price to drop in one year from 200-300 million to 150 million yen. JEOL is studying cost reduction with a view to resumption of marketing, but this will be quite difficult, with six other Japanese companies in the race, besides American, West German and British manufacturers.

Call for papers

A CALL for papers has been issued for Teleinformatics '79 to be held in Paris from May 28 to 30, 1979. The conference marks 10 years' development since the first international colloquium on teleinformatics in 1969.

The aim of the conference will be to explore the applications of networks and distributed systems with an emphasis on the uses and influences of new technology in society.

Those wishing to submit papers are required to send a synopsis before June 20. An application form may be had from AFCET, 156 Boulevard Pereire, 75017 Paris, France.

Kuwait buys simulator

A BOEING 747 flight training simulator has been ordered by Kuwait Airways from the Link-Miles Division of the Singer Company (UK). Using state-of-the-art digital technology and computer generated visual system, the simulator will be used to train flight personnel.

NCR and Nixdorf determined to stay in S Africa

By Esmond Frank, Johannesburg

THE rich markets in South Africa are proving a fertile sales field for several computer companies and further investment and expansion is planned despite political pressure to pull out.

Two companies, Nixdorf Computer of West Germany, and the US multi-national, NCR, have both expressed a determination to continue their highly successful operations.

NCR markets a whole range of equipment in the republic, from mainframes and minis to point-of-sale systems and electronic cash registers and, as Alan Huskisson, NCR managing director in South Africa, emphasises, the company has been in the country for 53 years and has every intention of remaining.

NCR is soon to move into its own £3 million building which it is said will house one of the most advanced computer complexes in South Africa.

Commenting on the restraints that had been put on some US companies supplying equipment to the South African defence and police forces (CW, March 16), Huskisson said he did not expect that there would be further restrictions.

Nigeria is also putting pressure on companies to choose between trading with "Black Africa" and South Africa.

Huskisson says that NCR's intention to stay in South Africa did not relate only to the fact that it wanted to do business there.

"We also have an obligation to our 1,000 employees in this country and to the many users of our equipment to ensure that units are properly maintained and that systems can be developed and extended," he adds.

During the past three years Nixdorf's investment in South Africa has nearly doubled and according to Klaus Luft, a member of the company's executive board, its stake is likely to grow despite any political pressure to pull out.

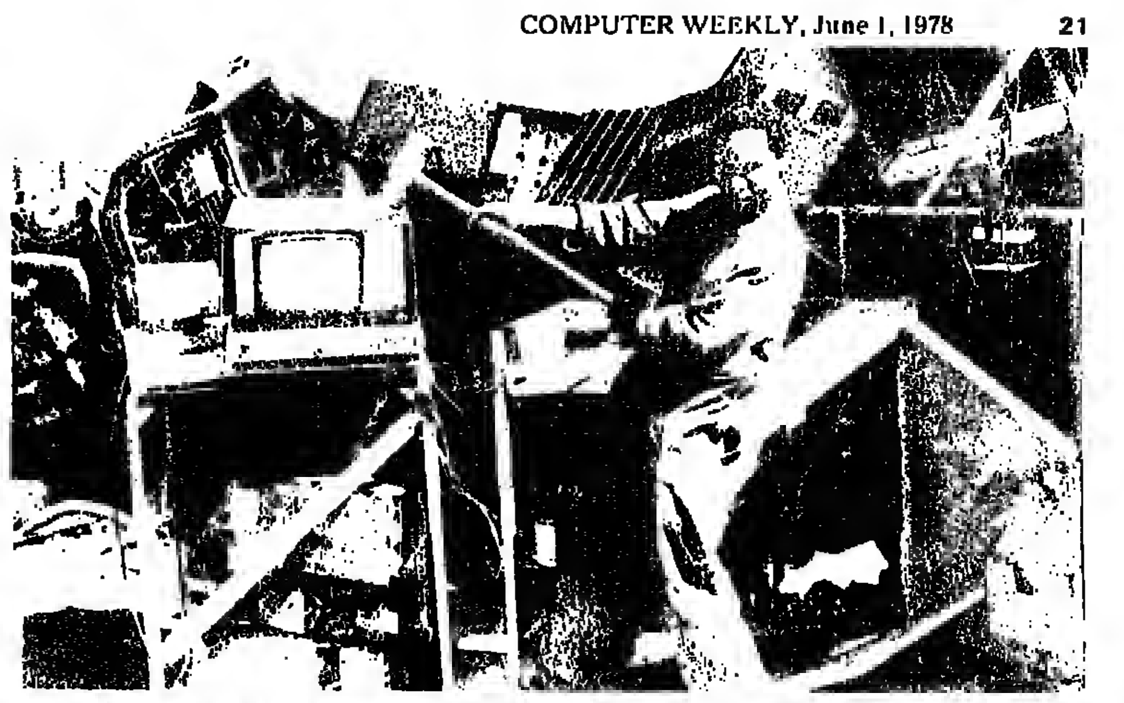
"It is our policy worldwide to operate purely on a commercial basis and we have never been influenced in our business decisions by local political or social conditions," says Luft.

"While we, as Germans, do not necessarily agree with certain policies in South Africa, it can also be said that we do not necessarily agree with the internal policies of many other countries in which we operate."

Last year Nixdorf's South African subsidiary achieved its highest ever level of sales. Turnover soared 28.5 per cent with sales up a massive 89.9 per cent. Productivity increased by 34.9 per cent. Luft would not give the turnover figure, but local computer circles put the figure at more than £890,000.

He says Nixdorf intends consolidating its position in South Africa by reinvesting its profits in the country and by introducing its latest systems. This year there is to be a drive on the intelligent terminal market.

He stressed that all company staff in South Africa, white and black, enjoy equal opportunities at all levels and this policy will continue.



Honeywell computers get the sledgehammer treatment at a metal dump near Johannesburg.

That's no way to treat a computer

A SCRAP metal dump in Germiston, near Johannesburg, has become South Africa's biggest graveyard for obsolete computers and the last rites are performed with a sledgehammer.

Metal and Chemical Industries, which specialises in the recovery of non-ferrous metal from scrap, has just condemned a batch of 300 Honeywell computers to an inglorious end. Managing director, John Hess, says he bought the computers, which were originally sold for about £29,000 apiece, for about £12.50 each.

"The computers, which were probably leased to companies and then traded in, are obsolete because their memory channels are insufficient to cope with today's demands," says Hess.

His company recovers gold and silver, as well as the copper used in the production of the machines.

Honeywell, which withdrew from the South African computer market in 1975 (CW, March 6, 1975), announced last year that it intends closing down its local servicing operation some time this year.

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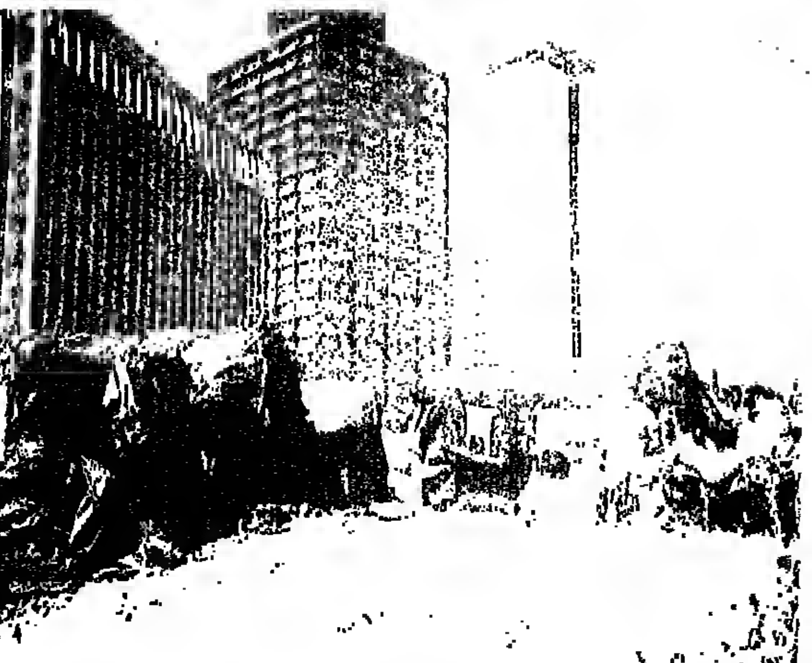
Where they build homes on paper tape



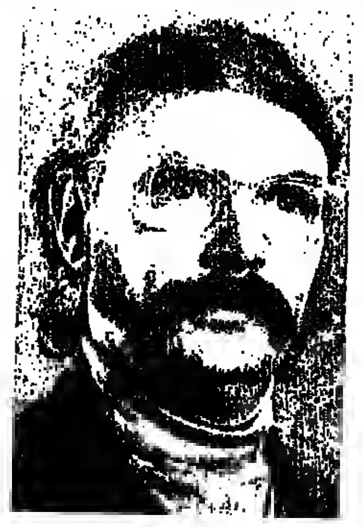
AFFLUENCE and squalor, ancient and modern, are inextricably intermixed in India. Nariman Point, a stretch of reclaimed land in Bombay, is the home of the city's computer companies, including, until June 1 this year, IBM, whose offices were in the building in the centre of this picture.

As well as housing the shining Air India building (right) and the luxurious Oberoi Sheraton Hotel, Nariman Point is the home of a shifting tide of shanty dwellers who make use of whatever materials come to hand to build their makeshift homes — including (foreground) punched computer paper tape.

Despite the visible signs of poverty that remain, the overall picture is changing rapidly for the better. Unlike the UK, India now manufactures almost all capital and consumer goods within the country, has a strong balance of trade surplus, and grows enough to feed all of its estimated 920 million people.

This year the country will meet 29% of its oil requirements. The biggest economic problem facing the new Janata government is a pleasant one. on what should this year's $6,000 million foreign exchange surplus be spent.

New opportunities — and doubts — as IBM pulls out of India



Tim Palmer reports on his visit to the sub-continent

THE imminent departure of IBM from India has created new opportunities and uncertainties in equal measure. Many of the top IBM employees have been recruited by independent computer services companies, but some of the younger employees question the future of computers in India after IBM closes, and are considering a move into some other field of activity.

Most IBM employees are, however, staying with one or other of the two companies which are being formed as a result of the closure.

Computer Maintenance Corp has been formed from IBM's maintenance operation in what is effectively a nationalisation of that part of the business. The majority of users are being presented with a straight choice between hiring CMC to do their maintenance, or doing it in-house.

The largest part of the IBM base of 250 systems is some 120 second generation 1401s, most of which were on rental at about 50,000 rupees, £3,300, a month. They are now buying their machines for a nominal sum, and CMC insists that their costs will be approximately halved. But there is some doubt about the level of maintenance service CMC will be able to achieve, at least during the start-up phase. It will have a staff of about 200.

The second company being formed will take over IBM's service bureau and punched card manufacturing businesses, under a formula blessed, although not yet formally approved, by the Electronics Commission.

The plan is for the employees to buy the business themselves forming a private limited company called International Data Management, IDM.

IDM says that it has promises of capital from almost all the intended employees and that it expects to be able to raise three million rupees, £200,000. Banks are usually prepared to advance up to three times the share capital value, and IDM says that this will be sufficient to put the company on a sound footing.

Observers doubt that it will be sufficient to finance the kind of growth IDM is projecting, pointing out that the company has to pay IBM for assets acquired on a still-to-be-determined valuation, that the interest on the bank loans will be steep, and that a new venture has been formed in India to manufacture punched cards in competition with IDM.

Estimates put the number of people likely to desert the new company at a minimum of 30% and some say it will be much higher.

Nevertheless the people forming IDM remain confident. They project a $8 million turnover in the first year, split 50/50 between data centres and punched cards. They will have a total of eight machines consisting of two 1401s in Bombay and Calcutta and one each in Delhi and Madras. In addition there is a 1401 and an 1130 at the Bombay factory, and these will be transferred to either new or existing data centres.

There is no question that data services are highly profitable in India, and IDM expects to be able to afford a new modern mainframe by 1980.

It also hopes to diversify into consultancy, software export, education and personnel selection, and looks for joint projects with European companies in Third World countries.

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ICL 1500 for the communications era. The significance of these enhancements, together with other hardware and software enhancements (COBOL is now available) is that ICL 1500 now has a powerful interactive capacity.

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UN body expected to take first Amdahl

THERE could soon be an Amdahl 470 mainframe in India, if the IBM plug-compatible machine finds favour with the United Nations Development Programme, the UN body which is part-funding India's National Informatics Centre.

The NIC is being established in New Delhi as an information system and planning tool for most of the ministries in the Indian government. First details of the system appeared exclusively in Computer Weekly (CW), September 16, 1976).

The mainframe will be used to store a number of large databases, and will support a hierarchical network of minicomputers and mini-based intelligent terminals.

The minis being used at present are Hewlett-Packard HP-21MX machines, and Computer Automation Alpha LSI-2s for the terminals. But it is planned that three different types of mini will be used in the full system.

United Nations Development Programme is putting up a total of $4.5 million for the project, including $3.3 million for the mainframe. All the major mainframe manufacturers are bidding for the mainframe contract, including IBM, Burroughs and Univac. ICL is understood to be bidding a 2980.

Although ICL, Burroughs and Univac are the three manufacturers currently in favour with the Indian government, and a decision in favour of IBM would be unpopular, the procurement is being handled by the United Nations agency, so no manufacturer can be ruled out.

The mainframe is due to be installed early in 1979.

Dairy board gets first 2950

THE first ICL 2950 in India is likely to be installed with the National Dairy Development Board. Due for delivery in September, the 753K byte 2950 is to be used to run a new system recording and comparing milk yield and other statistics of dairy herds throughout the country.

Although the application is a new one, the DME facility which emulates the ICL 1900 machine environment will be used to start with, although later the dairy board plans to convert to VME/K.

The universities will also get 1900 systems from ICL.

Making 8,000 teleprinters a year

FOR well over a decade, Hindustan Teleprinters in Madras has been building the Olivetti T2 5-bit teleprinter, and is now one of the largest manufacturers of teleprinters in the world, producing up to 8,000 a year.

Although the model built by Hindustan Teleprinters was discontinued by Olivetti in 1971, it is particularly suited to Indian conditions, being electro-mechanical and therefore labour-intensive to build and simple to maintain.

Although built almost exclusively for domestic use, the Indian-built teleprinter scored internationally when it was selected following a competitive tender by the Mauritius post and telegraph authority.

[illegible]

Users tell how OCR is helping to solve data input problems

COMPUTER users from Burnley and Budapest met in Prague last month for one of the most unusual user conferences ever held in Europe.

The subject matter of the conference, optical character reading, was somewhat out on a limb, but the thing that really gave the whole affair its highly original flavour was the extremely cosmopolitan nature of the delegation, drawn as it was from all parts of Europe — East and West.

The one thing the delegates all had in common was an interest in the OCR systems manufactured by the US-based firm, Scandata, and most of them were existing users with something to say about how they were using OCR to help solve their data input problems, and also about the limitations of the technique.

Considering the variety of mother tongues — eight altogether — communications proved surprisingly easy, most of the proceedings being conducted in English, with simultaneous translation in German and Czechoslovakian.

English was the dominant language because the majority of the formal speakers were from the UK where Scandata's European marketing operation and some of its oldest established users are based.

One of the oldest, the Commercial Union Assurance Co, was represented by operations manager, Russell Greening, who talked about how OCR enabled his company to phase out its central key punching operation and put the data preparation task into the hands of 200 typists at its 66 branches where most data originates.

The Scandata system also reads data generated on Commercial Union's line printers which are soon to be replaced by IBM 3800 laser printers and Greening brought along some samples of 3800 print to show delegates what he regarded as the excellent OCR readability of the characters.

A form of OCR input where the readability is not always excellent — handprint — was discussed by John Goodfellow of the Burnley Building Society whose Scandata system reads handprinted documents from 500 different locations in the UK.

Goodfellow suggested that his organisation had over-estimated the amount of training required by staff to enable them to handprint acceptable numeric input and he pointed out that even with a 25% per annum turnover in female staff the character reject rate remained steady at a monthly figure of between 1.3 and 1.8%.

One of the other speakers at the conference, from the West German TV and radio licensing authority, GEZ, appeared to have few problems if any with his OCR input, mainly because most of it took the form of turnround documents, where the quality of the print is controlled directly by the user.

Another acceptable form of OCR input, if the OCR system can mechanically handle them, are tally rolls, which is why Denis O'Leary from the Bank of Ireland was asked to talk about the way his organisation opted for OCR as its main data input method so it could continue to make full use of tally roll equipment already installed at its branches all over Ireland.

Mixed media data entry in a credit card company was discussed by Peter Rawlinson of Access which operates a Scandata 2250/3 configuration. This includes a four-terminal key-to-disc system used for entering non OCR readable data and for re-entering characters rejected by the OCR reader.

Providing a welcome contrast to the rather down to earth commercial OCR applications described in most of the papers the one speaker from Italy, Dante Matteucci, of the Italian national research council's computing centre, CNUCE, described a project getting under way to create a databank of Italian fine arts using OCR.

Matteucci explained that CNUCE was working with the Italian Ministry of Fine Arts on the project and had developed a standard input document that can be filled in using a typewriter and then sent to CNUCE in Pisa for reading.

He said that two test batches of documents typed up in two different parts of Italy had both been read by a Scandata system with some success. One batch of 1,000 documents held details of the fine arts objects in the Necropolis of Paestum near Naples, which, like Pompeii, was buried by the eruption of Vesuvius. The other had 5,000 documents relating to objects in the town of Vigerano near Milan.

Matteucci estimated that the database will take about five years to complete and will run on one of CNUCE's large scale IBM mainframes with IBM's information retrieval system, Stairs.

The charm and magic of a beautiful city...

A HACK travel writer would probably describe Prague as a beautiful, timeless city nestling in a charming wooded river valley dotted with fairy-tale baroque churches. And he would be right.

At the same time he could also point out that some of the picturesque old buildings which grace the Czechoslovak (and Bohemian) capital could do with a clean-up, because Prague is also a major industrial city and the grime of 100 years of heavy industry is rather less flattering to mediaeval masonry than the dust of ages.

But, without doubt, Prague is one of the most under-rated cities in Europe as far as looks and charm are concerned, and after the visitor has tired of strolling round the intimate little streets and alleys of the old quarter he can stop off at one of its many tiny beer halls.

The city also has a night life, concentrated around Václavské Náměstí (or Wenceslas Square as the English insist on calling it), where you're unlikely to find a deafening disco or a sex show, but where each of the main hotels incorporates a cabaret and night club at which the music is guaranteed to take any English guest over 30 back to his teenage years.

At the same time he can recapture his long lost youth more vividly by dancing with some of the beautiful young girls who frequent these rather old-fashioned establishments in surprisingly large numbers.

But the one entertainment in Prague definitely not to be missed is the Laterna Magika, the Magic Lantern show. It sounds like a genteel Victorian "divertissement," but turns out to be a stunning audio/visual experience combining mime on stage with action on film. It develops the "gimmic" of performers moving from the stage into the film and back again brilliantly, to unfold a fantasy tale that leaves one at the end with very little idea what it was really all about but with an enormous respect for the skill and imagination of its Czech presenters.

Delegates see Scanplex in action

Scandata has 11 installations in Czechoslovakia, including the one above at chocolate manufacturer Cokoladovny, which was visited by most of the delegates from all over Europe who attended the Scandata user group meeting in Prague. They are seen here taking a look at the Scanplex key-to-disc system which is used to capture non-OCR readable data and to re-enter characters rejected by the OCR system in the room next door.

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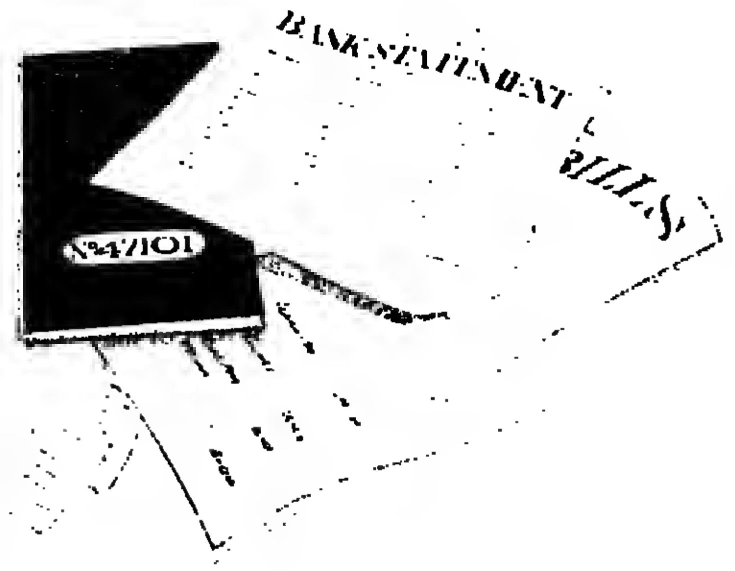

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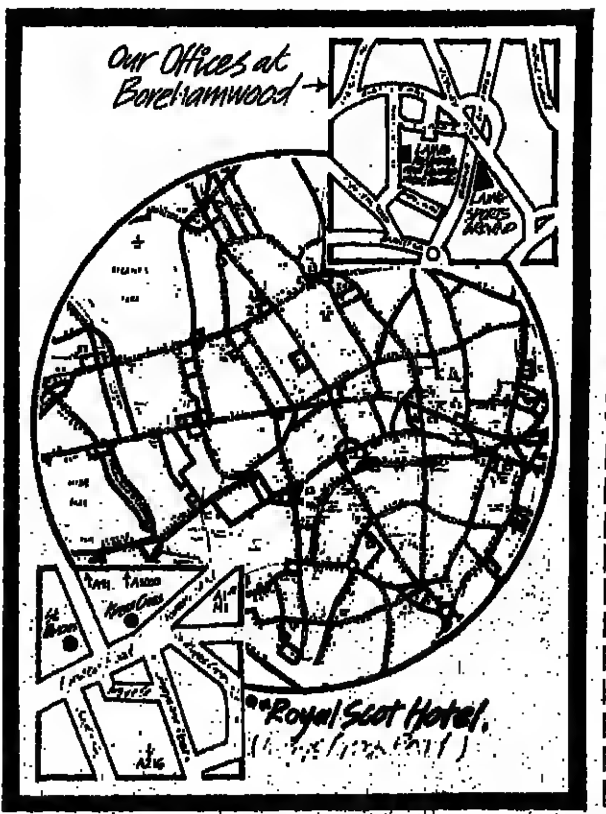

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ADMINISTRATIVE COMPUTER UNIT

PROGRAMMER (TO £5,282)

An experienced 1900 COBOL Programmer is needed to join a small team in its continuing development of on line systems for the University administration. The systems are based on a 96K ICL 1902T with TPS, running under COMMS MANAGER and GEORGE 2. FIND and FILETAB are also used.

Applicants should preferably have communications experience, but applicants with other experience will be considered and for them the post would offer an opportunity of working with staff who have already developed a complex real time system.

Salary within the range for Administrative Staff Grade 1B. Superannuation.

Applications, quoting two referees, should be sent to the Registrar, The University, Manchester M13 9PL. Quote ref 144/78/CW.

CITY OF MANCHESTER Treasurer's Department

COBOL PROGRAMMERS ANALYST PROGRAMMERS

£3,398-£4,214 p.a. (including supplements)
(Phase III increase expected from 1.7.1978)

Based in the City Treasurer's Computer Section which operates an ICL System 4/72.

Applicants should have experience in systems analysis or programming using COBOL or another high level programming language.

The successful applicants will be responsible for detailed systems and form design, project documentation, program specification and programming. The work is varied and interesting. There are several advanced on-line systems, with more to be developed in the future.

Conditions of employment are good and follow normal local authority practices. A 35-hour week with flexible hours is in operation. The salary is in accordance with a salary scale Grade AP3/4 £2,973-£3,789 plus £312 annual supplement plus a further supplement of 5% with a maximum of £4 a week and a minimum of £2.50 a week. Starting salary will be according to age, experience and qualifications.

Applications giving details of age, education and experience to date should be returned to the City Treasurer's Department, P.O. Box 314, Town Hall, Manchester M60 2JR.

JBA

Senior Analyst/Programmer

Paris **over £10,000**
London **c. £7,000**

An international trading organisation with offices throughout the world wish to appoint two Analyst/Programmers, one in Paris and one in London, to continue the development of commercial applications for the company.
Applicants must have several years experience of commercial systems. Using real-time and database, on a minicomputer, preferably an HP3000 but other similar machine background considered. Ability to take responsibility and work on own initiative is essential.
Salaries negotiable according to experience. Excellent fringe benefits and opportunities for worldwide travel. **Contact: Jim Baker**

Terminal Sales Executive

London **over £10,000 on quota plus car**

Our client is a well known terminal manufacturer in the United States with an established operation in this country. Due to continued growth they wish to expand their sales force and are looking for a person with a proven ability in the terminal or computer services market. The headquarters of the UK company is southwest of London but the territory to be allocated will be in the City. This is an excellent opportunity for a capable sales executive as an early promotion can be expected.
Salary and fringe benefits are above average. **Contact: Jim Baker**

Telecommunications Consultant

North of London **up to £8,500**

Our client is a well-respected manufacturing organisation with a continuous and rapid growth record. This vacancy presents an excellent opportunity for an experienced communications expert to join a team working on the development of Distributed Processing Products.
Ideally we are looking for technically competent individuals with a minimum of 5 years up-to-date knowledge of communications including an understanding of hardware and software developments in this area. The person appointed will be responsible for providing technical direction to the company's communications policy. The range of benefits offered is extensive and include relocation expenses and regular career assessments.
Contact: Margaret Stevens

Systems Programmer

South of London **up to £7,600**

This major production and distribution organisation seek a programmer with IBM systems experience, preferably with previous or current TP involvement. Currently installed are two large IBM370 systems, running BATCH and TP applications under VS/1 using CICS/VS, VTAM, VSAM, etc. The configuration also supports a VM370 interactive facility. The vacancy would ideally suit a highly self-motivated systems programmer with, say, 1 or 2 years direct experience who is seeking a major improvement on salary and career development (salary progression is rapid and attractive). The successful candidate will enjoy excellent working conditions, significant autonomous responsibility, and large organisation benefits.
Well suited applicants will receive immediate introduction to our client
Contact: Mike Creamer

IBM Systems Programmers

Mid-Sussex **circa £7,500**

One of the leading Computer Service Companies in the UK requires experienced IBM systems programmers to join a team involved in the support and development of their system control software. Multiple IBM or IBM-equivalent mainframes are used to provide an extensive range of services including batch, R.J.E. batch, timesharing etc., on a large teleprocessing network.
Major control software extensions and modifications are undertaken by the Systems Programming Group to provide the advanced facilities and performance that are essential to the Bureau business.
Salary is negotiable according to experience, *with excellent conditions of employment and opportunities for career advancement.*
Contact: Margaret Stevens

Project Managers

North London **neg £7,500 +**

Continued expansion and development within our clients organisation has created vacancies for capable, self-motivated project people to join its management team. Teams tend to be small but highly effective with total responsibility for design implementation and support of major applications. Specific experience of accounting or marketing systems will be considered an advantage as is a proven track record in project management. These are key appointments within a major bureau, therefore salaries will reflect the importance of the posts.
Subsequent career development is dependent on the individuals ability.
Contact: Margaret Stevens

Support Analysts

West of London **neg to £7,000 + car or allowances**

If your present responsibility is to implement commercial systems and you feel that the next challenge is to join a sales support team then our client is currently able to offer such a position. The company manufacture mini computers and has enjoyed a steady growth over the last few years, a pattern which is expected to continue into the future. This position requires that candidates have a good grounding in basic d.p. disciplines as the company market a wide range of both tailor made systems and standard packages for general commercial usage. The successful applicants will be able to work on his or her own initiative, and will be happy to fit into a small and friendly team.
Career prospects are dependent on the success of projects and resulting expansion… **Contact: Margaret Stevens**

Technical Author

Surrey **£6,500-£7,000**

A major international group require a Technical Author for the preparation of manuals relating to computer applications used throughout the U.K. group. The applications include BATCH and real-time systems and distributed processing using advanced design concepts. Both highly technical manuals for use by implementation and support teams, and manuals for end users of group standard systems, are to be produced.
This position would be of interest to authors of proven ability in communicating complex technical information in a form appropriate, and readily understandable, to the areas for which the publication is intended.
Knowledge of applications relating to materials management and of IBM computers is highly desirable.
First class opportunity to enter an attractive career situation.
Generous relocation will be paid where appropriate
Contact: Mike Creamer

Process Control

Bracknell **up to £6,000**

A small development group has been established in Bracknell by an international engineering organisation to continue their expansion of the industrial systems market. They have immediate opportunities for mini computer programmers and specialists to work at all levels on these projects.
Applicants must have at least two years experience in industrial or process control applications using mini computers. A sound background of FORTRAN, CORAL, RTL/2 or Assembler is essential.
Excellent salaries, relocation expenses and the opportunity for commissioning work in various parts of the world. **Contact: Jim Baker**

AUSTRALIA

Computer professionals with more than 3 years experience who are determined to emigrate to Australia will benefit from our consultancy service.
Initially, we advise and provide an assessment of your career prospects in Australia and, later, when your arrival there is imminent, you receive the concentrated services of our Associate company in setting up introductions to suitable vacancy positions in Australia.
Since JBA commenced this service we have been extremely successful arranging a selection of possibilities for people arriving there (mainly in Sydney and Melbourne) and the people concerned thereby found ideal employment very quickly. **Contact: Mike Creamer**

For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

FROM THE UK . . . TO THE USA

Programmers/Systems Analysts/Systems Programmers/Software Development Specialists . . . with 2-10 years' exp. on large-scale and/or mini-computer systems (S/360/370, H-600, U-1100, etc.; and/or DEC/DG/H-P/etc. minis) . . . for July-Sept. start-date with leading international computer-consulting and turnkey-systems firm. Must be willing to train and work USA-wide and at future UK/European locations. Dedicated results-orientated professionals, who are interested in top career-growth opportunities, *please send:* summary of educ./exp./salary-progress, and home and office contact-info and June 7-23 interview availability, to Jim Allen, Harvey Pesneck & Assoc., c/o:

INTEX (Execs, UK)
Chancery House, 53/64 Chancery Lane
London WC2A 1QU. Phone: 01-831 6925

Systems Consultant

Hertfordshire Based **to £6,000 p.a. + Co. Car**

Specialists in distributive computer systems, the DATA 100 Corporation is established amongst the 'Top 25' American computer manufacturers.

Since its formation in 1970 the Company's outstanding success has been based on equipment reliability, unrivalled customer support and dedicated sales effort.

The continuing expansion of the U.K. company and the growing demand for our products have created significant opportunities in the general sales and marketing area.

Applicants should possess a good working knowledge of small business systems and communication/key to disk equipment. In addition to becoming an important factor in Data 100's exciting future, systems consultants could be considered future members of our highly successful sales force.

If you feel you have the experience that would contribute to our continuing success please contact:

Helen Mitchell,
DATA 100 Systems Ltd.,
Arden Grove, Harpenden,
Herts. AL5 4UD.
Tel. Harpenden 63161.

DATA 100

ANGLIAN
D P SERVICES LTD

RPG2 PROGRAMMER £4,500

Our client, an International Insurance and reinsurance broking company wish to recruit a young RPG2 programmer to join their expanding computer dept.
The successful applicant will report directly to the Computer Manager and responsibilities would be to assist, extend and develop the existing computer system and also on-line system using CCP.
Our client's existing 8BK System 3 Model 12 is due to be replaced by a 160K Model 15 in October.
Excellent fringe benefits are offered including Luncheon Vouchers valued at 50p per day. Pension and Life insurance scheme and Sports and Social Club.
For further details and an application form please contact us at the address below
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كاملة من الأصل

SYSTEMS & PROGRAMMING MANAGER

Salary negotiable

c £7,000 p.a.

THIS POSITION SHOULD BE OF INTEREST TO YOU IF YOU ARE LOOKING FOR YOUR FIRST STEP INTO MANAGEMENT.

Our client is e large internationol Wholesale and Distribution organisation, based in Central London.

With mejor market and distribution centres throughout the U.K., they depend heevily upon the efficiency of their data processing service. With this in mind, they are introducing country wide Distributed Processing based on e series of mini computers. In addition, they are also actively engaged in the installation of eccounting peckages on their IBM mainframe.

A key position hes now erisen for someone, who can demonstrate both technical and leadership ability, to be responsible for the development team. You will heve e sound knowledge of commercial systems obtained in an IBM 360/370 instellation. If you have elso gained experience on mini computers, then so much the better.

So, if you feel you ere ready to meke management the next stage in your career, contact Marilyn Black quoting ref CW/1591, as soon as possible.

Computing Services Association

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Tel: 01-828 5356 - 24 hour answerphone service.

JOHN GOLDSMITH (Computer Recruitment) Ltd.

KUWAIT

Systems Analyst up to £12000 p.a. TAX FREE

Our client is a major commercial bank engaged in the whole range of banking activities in Kuwait. The operation is extremely profitable and is expanding rapidly.

Reporting to the head of the EDP Division, the Systems Analyst will assist initially in the implementation of the current and savings account system and will act subsequently as project leader for the design and implementation of future computer based systems.

Successful candidates will have

- about two years' practical programming experience, preferably on IBM hardware under DOS/VS.
- at least two years' additional experience in all stages of systems design and implementation.
- experience of financial systems particularly in the banking area.

This opportunity to build up capital from a tax-free income would suit a married man, preferably under 30, without children of school age. Free furnished accommodation is provided, together with an interest free loan for car purchase and return air tickets annually for family.

Initial interviews will be held at our offices, and shortlisted candidates will be interviewed by our clients in London in early June.

Please ring us for an initial confidential discussion, quoting ref. 879W. Alternatively, leave a message on our answering machine after hours or write briefly.

Tel: 01-637 5796

EDP Systems
52-53 Margaret Street
London W1N 7FF

FERNHART LTD.

requires experienced freelance 1900/2903 Cobol programmer to work in Surrey for a minimum period of 3 months commencing early June.

Excellent rates payable to personnel of the right calibre
Telephone David Patts on 01-661 6044

Agency No SE(b) April 3

Customer training manager

PARIS

Some companies just continue to grow.

Look at DATA GENERAL, 41% last fiscal year with a net profit of 11% on $ 260 millions. We have now over 50.000 of our minis worldwide and a good chunk in Europe. That is why we need you! To keep pace with this growth we need the right people!

We are looking for a
CUSTOMER TRAINING MANAGER - EUROPE
- who will be responsible for the development of the customer training organisation in Europe
- who will have customer training staff in all Europe functionally reporting to him
- who will implement company developed courses and policies in this field in the various countries
- who will market these services
- who will have full profit and loss responsibility
- who will travel within Europe and to the US regularly

To do this we need somebody
- who has at least 6 years experience in the (mini) computer industry
- who is oriented towards software and customer training
- who is fluent in English and preferably some other European language(s).

Interested?

Send your C.V. to our
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JAN CEDERLUND
81, rue de Courcelles 75008 PARIS.

with

Data General

Cobol Programmers

Does your salary reflect your ability?

It will, here at Honeywell. We are looking for experienced Cobol Programmers to join our Internal Business Systems Department in our Head Office at Brentford, Middlesex, where the development and enhancement of our extensive data base and communications network calls ideally for Programmers with data base, communications and transaction processing experience.

If, however, you are unable to offer this breadth of experience but have programmed in Cobol for at least 18 months, we would still like to hear from you if you are ready to develop your skills with a highly successful manufacturer.

Your salary will be directly related to your experience and scope for career development into either areas of the Company's business such as software development, technical support, software support, education and sales and marketing is actively encouraged.

Please telephone Angela Kidd on 01-568 9191 Ext. 325 and ask for an application form or further details.

Honeywell

MIDLAND RECRUITMENT FEATURE

Advertisers are reminded that on June 22 Computer Weekly is highlighting career opportunities in the Midlands with a recruitment feature.

To secure space in this important feature

Contact Alan Bacott 021-355 4838 or John Farrar 01-261 8098

Copy deadline 4 p.m., Friday, June 16

Discuss your career with the decision-makers not the go-betweens

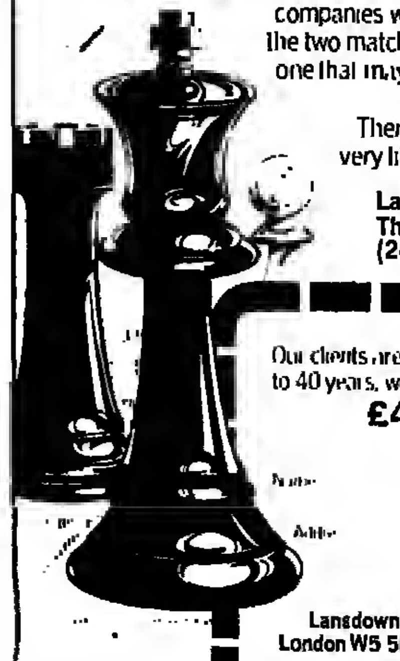
Go to some agencies and you may have 2 or 3 interviews before you even get to meet an employer... let alone one who's actually interested in meeting you.

This won't happen at Lansdowne – in fact, it can't.

As soon as we receive the coupon below, we'll send you a confidential application form – treat it as an interview... simply fill in relevant details about your work, ambitions and the companies you don't want to join. We'll take it from there.

We'll match this information to the needs of our clients – over 3000 influential companies who actively look for key personnel. Every time the two match up, you'll be shortlisted for an important job... one that may never have been advertised. Then our client will contact you direct.

There's absolutely no risk, no cost, no obligation and very little chance of being sent on a wild goose chase.



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Our clients are keen to meet men and women aged 20 to 40 years, with potential earnings of between

£4000 and £7500 p.a.

Name

Address

CW1/6

Lansdowne Appointments Register, Design House, The Mall, London W5 5LS. Tel: 01-579 2282 (24 hour answering service)

Lansdowne

For those too busy doing a good job to find a better one.

Senior Training Instructor £7000+

ComputerAutomation is the world leader in minicomputer technology, and the Naked Mini Division requires an additional senior instructor for the Training Department, based at the European headquarters, Rickmansworth.

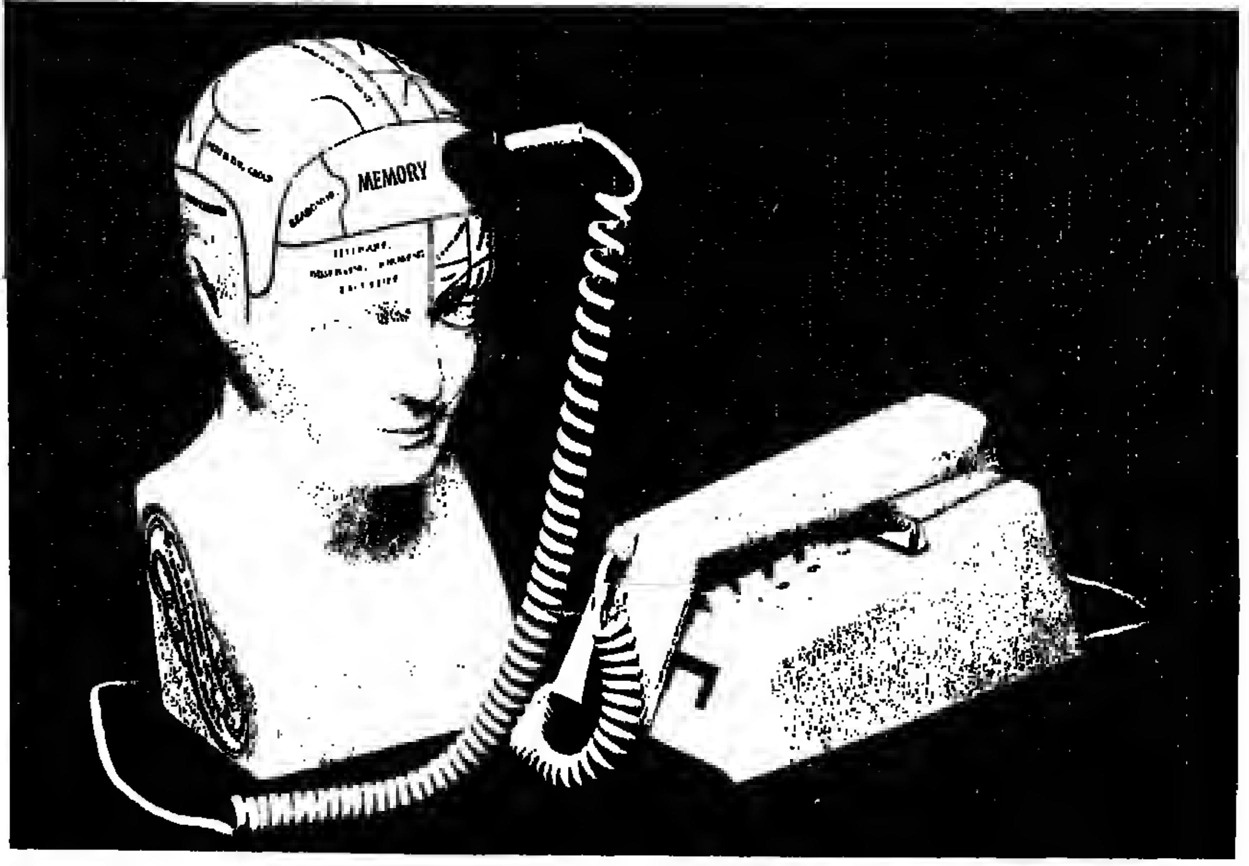
You will be responsible for preparing and running customer training courses covering fundamentals, hardware, interfacing, assembler level programming, operating systems and real time executives. Special tailor-made customer courses are also organised.

You should be capable of covering the entire training specification, but a strong software bias would be an advantage. Previous lecturing/training experience is essential, preferably with a minicomputer manufacturer.

Benefits include pension scheme and life assurance, and private medical insurance.

For further information, and an application form telephone Mary McCarthy on Rickmansworth 71211 or write:

CAI LIMITED
(ComputerAutomation)
Hertford House, Denham Way,
Maple Cross, Rickmansworth,
Hertfordshire WD3 2XD
Tel: Rickmansworth (09237) 71211
Telex: 851-922654



Soon it will remember to call you back

The introduction of microprocessors and integrated circuit chips into telephone switching equipment opens up completely new horizons for the telecommunications engineer.

The availability of these components is stimulating the ingenuity of designers working at the forefront of telephone switching systems, enabling them to provide features in telephone exchanges which will improve the facilities available to telephone users at home or in the office.

Real time programmers have an increasingly important role to play as the emphasis in system design shifts towards software engineering.

STC is currently developing and manufacturing a range of switching products designed to give a significant boost to new and existing communications systems destined mainly for export markets.

The future with STC. As a world leader in the field of communications, STC is mindful of its responsibilities to the men and women on whose skills and creativity the future depends. STC practises an open and flexible style of management: and it has evolved a well-defined personnel policy, including training and career development, to enable staff to benefit from new techniques and technologies and to fulfil their potential within the Company.

If you're at the start of your career or an experienced engineer looking for further scope, watch out for vacancies in individual advertisements — or to learn more about STC and what we can offer you, write for our Information Pack to Juliet Rowe (Reference WE), Personnel Department, Standard Telephones and Cables Limited, STC House, 190 Strand, London WC2R 1DU.

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Cheshire

Computer Programmer

AP1/5
(Career Grade)

£2,127-£4,095
plus supplement
of between £442.32
and £520.56 p.a.

Required for the development and implementation of computer systems. Keen interest in mathematics and data organisation is essential. Some experience of programming in PL/1 would be an advantage. The Department uses an IBM 370/145 computer via VDU, batch terminal and graphic devices. Training in engineering applications and computing methods will be given. The post would be suitable for a graduate straight from University who [illegible] technical computing.

Application forms and further particulars are obtainable from The Director of Highways and Transportation, Cheshire County Council, Backford Hall, Nr. Chester CH1 6EA.
Closing date: 12th June.

CAPITAL APPTS.

FORTRAN
PROGRAMMERS

[illegible] required for [illegible] and Scientific. Develop [illegible] £3,000 to 000
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Telephone for free list of VACANCIES

25 Windmill St. London W.1.

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Programmer/ Analysts

Salary range £3.5k-£5.5k

Join us in producing some of the most advanced real-time banking and communications systems in the world. To cope with an expanding order book we need staff to develop and maintain systems PDP 11 hardware using our own AIMS-11 software. Although desirable, neither banking nor DEC experience is necessary but we require you to be a self-starter with sound programming knowledge and the ability to work in an informal yet technically demanding environment.

Benefits include excellent contributory pension schema, life assurance and sickness schemes, private medical insurance, luncheon vouchers, 4 weeks' holiday and opportunities for customer contact and working abroad.

[illegible] 01-[illegible] 2047 [illegible] 4579 evenings and weekends, or David Lawton on 01-248 6499 (Woking) 04862 61091 or write to 160 Queen Victoria Street, London EC4V 4DV.

WE HAVE THE BEST JOBS!

JUNIOR PROGRAMMERS
£3,000 to £4,300
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You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them. CW22/1 Annette

SYSTEMS PROGRAMMER
£7,600
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You're lucky. You could be working on one of the 3032 installations in the country, shortly arriving. At present this major Industrial user has the latest IBM 370 CICS/VS. VTAM. CMS installation. They require a systems programmer with good T.P. experience that will only benefit from a job on the latest equipment. CW22/2 Annette

MINICOMPUTER PROGRAMMERS
£4,000 to £7,250
LONDON & HOME COUNTIES

If you have experience in ASSEMBLER or micro-code or communications for at least 1½ years then a whole exciting field is open to you. We now have opportunities in SW, NW or W London, Surrey, Berks and Hertfordshire for competent people in this rewarding field. The future is definitely going to be with the MINI-computer Professional. Telephone for details. CW22/3 Michael

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A major commercial organisation with a medium sized ICL 1900 computer running a 2 shift system requires GII operators who enjoy cheap beer and an active S&S club. Lively firm. CW22/4 Patricia

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If you are looking for career progression with very good promotional prospects then apply now. Excellent IBM OS/VS installation with company benefits like 4 weeks' hols, Non C P S, and a subsidised canteen CW22/5 Patricia

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A major IBM 370/OS user is offering really excellent perks including high salary and paid overtime plus paid removal expenses. You must have a minimum of 1 year's OS experience though. CW22/6 Patricia

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Applicants are required to control the Hardware side of this major IBM & ITEL installation. They will provide control over the CPU, discs, tapes and standby generator, etc. The installation belongs to a major commercial company with three other large IBM computers in the UK. There is paid overtime on top of this days only job. Relocation expenses paid plus other large company perks. CW22/7 Michael

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REUTERS REUTERS REUTERS

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As a major world news organisation, Reuters is continually exploiting the development of mini-computer based systems that best serve the needs of the business world.

Our immediate need is for programming staff with 2 to 5 years experience in real-time communications, mini-computers, or software design. Ideally we would like to hear from applicants with experience of RSX11M or RTL/2 but if you do not have this experience we will train you.

Our salaries are competitive and match individual qualifications and experience. Career prospects are excellent and if you have the flair to become a top notch top down designer you could expect to earn up to £10,000 within a reasonable period of time.

If you require more detailed information please telephone Mr Jones or Mr Lathlaill on 01-353 7114, or write or telephone for an application form to:

Recruitment Executive
REUTERS
85 Fleet Street, London EC4P 4AJ
Telephone 01-353 7129
(This is a 24 hour answering service)

REUTERS REUTERS REUTERS

SYSTEMS ANALYST/PROGRAMMER

AP5/SO1 £4,526 - £5,246 incl.

This post offers a challenging and rewarding opportunity to participate in the development of the full potential of an ICL 2903 computer. Applicants should have some experience of systems analysis as well as programming.

Generous disturbance allowance/relocation scheme in operation. Possible assistance with housing.

Application forms, returnable by 16th June are available from Personnel Section, Manor House, Swanscombe, Kent DA10 0BS. Tel. Greenhithe (0322) 842431.

DARTFORD Borough Council

EXPERIENCED SALES CONSULTANT

Quote Earnings £10,000 to £12,000 p.a. plus car

An experienced Sales Consultant is sought by a small expanding London based consultancy specialising in contract systems analysis and programming, fixed price computer systems and data processing consultancy. Applicants must have proven experience of initiating and closing contracts as well as maintaining close links with clients in this field. The above salary is an estimate for the successful candidate's first year, substantial improvement may be made on this in later years coupled with the opportunity of a directorship by the right person.

Write, enclosing c.v. or telephone

Ian Cochrane
Harris Baldry Consultants Ltd.
101A Clapham High Street
LONDON, SW4 7TB

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assyst

Consultancy
Software
Computer Services

Assyst is the leading computer bureau and consultancy group of companies operating in Saudi Arabia and Gulf and has offices in Riyadh, Al Khobar, Dubai, the North East of England and Amsterdam.

The company has grown considerably in the past three years and offers experienced D.P. professionals the opportunity to grow with it.

Our long-term plan indicates a link-up of all our 4 datacentre computers to a mainframe host computer with minis in turn linked to the datacentres.

Due to our continued growth the following positions are now available.

SYSTEMS ANALYSTS and ANALYST/PROGRAMMERS for our software house in AL KHOBAR, SAUDI ARABIA

Experienced in one or more of the following:

- Interactive mini/micro processing
- IBM Sys 3/15 with CCP
- IBM Sys 370
- Teleprocessing
- COBOL
- RPG II
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- Business Applications

Benefits include:

- Tax-free salary c. £10K
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Please write or telephone for an application form to:

ASSYST (U.K.) Computer Services Ltd.
Derwent House, District 1, Washington, Tyne and Wear
Telephone: (0632)-460560/460860

MARTINS COMPUTER SERVICES

The D.P. Recruitment Specialists for the Midlands/West Country areas

MANAGEMENT

COMPUTER MANAGER required by our client and engineering group to implement and control the installation of a Honeywell 62 Series computer. Practical experience with engineering production and financial applications essential. Area Staffs. Salary up to £7,500. Ref M18

SUPPORT MANAGER for mini computer manufacturer. At least 5 yrs. in commercial systems. Previous mini-support experience an advantage. Area Birmingham. Salary circa £6,000 plus company car. Ref. M13.

COMPUTER MANAGER to control and develop all aspects of Systime 5000 128K Mini Computer. Working knowledge of Basic+ under RSTS/E an advantage. Experience with a similar language considered as a Conversion training course is available. Area Birmingham. Salary c£5,000. Ref M28

PROJECTS MANAGER required by International Organisation with Manufacturing Units throughout Europe. The job will involve development and implementation of ON-LINE Systems utilising DATA BASE. Working knowledge of Assembler and Cobol plus thorough expertise of Commercial systems using IBM Mainframe and Mini computers. European travel occasionally. Area Near Birmingham. Salary to £8.5K. Ref M14

PROJECT LEADERS/ SYSTEMS ANALYSTS

PROJECT LEADER at least 4 years' plus experience in Commercial Systems. On-line experience an advantage. Area Coventry. Salary to £8,000 Ref. SA24.

PROJECT LEADER. Responsible to Group Data Processing Manager, at least 2 years' Production Planning and Control Systems, plus a formal programming background in Cobol or RPG. Experience of a small mainframe and terminals required. Area Worcester. Salary to £8,500. Ref SA098

SENIOR SYSTEMS ANALYSTS. At least 5 years in D.P. Preferably experienced on ICL Hardware developing Real Time. Area Leicester. Salary to £6,500. Ref. SA132

SYSTEMS ANALYST, at least 3 years' in Programming and Analysis. Area Bristol or Somerset. Salary to £5,000 Ref SA131.

SENIOR SYSTEMS ADVISOR. Required by mainframe manufacturer for pre- and post-sales work. At least four years in Commercial systems including a working knowledge of Cobol or RPG 2. Area Midlands. Salary c.£5,750 plus generous car allowance and expenses. Ref. SA128.

SENIOR TECHNICAL ADVISOR required by Major Mainframe manufacturer, at least 6 years' systems experience with an in depth knowledge of most Commercial applications. Area Birmingham. Salary c £8,000. Company car supplied. Ref. SA125.

PROJECTS LEADER/PROGRAMMING. At least 8 years in D.P with On-line and database experience. Area Lincolnshire. c£8,000 Ref M24

SENIOR SYSTEMS ANALYSTS. Owing to expansion a number of positions have arisen, candidates should have a degree plus On-line or Database experience. Area Birmingham. Salary to £6,800 Ref. SA123

SENIOR COMPUTER AUDITOR. At least 5 yrs in DP. Practical experience in auditing with a background of systems and programming. An accountancy qualification an advantage. Area Birmingham. Salary circa £8,000 plus car. Ref. MS19.

ANALYST PROGRAMMER at least 3 years D.P. experience including Development and implementation of at least one on-line system using Data Base. Language Cobol. Successful applicant may be required to attend courses in the United States of America. Area Near Birmingham. Salary to £6,000 Ref SA130.

SYSTEMS ANALYST at least 2 years Commercial Systems. Area Leamington. Salary c£5K Ref P260

PROJECT LEADER in charge of small team using RJE Terminal linked to IBM 370. Good knowledge of CICS and IBM Cobol plus Commercial Systems experience from feasibility to implementation. Area Birmingham. Salary c£6,500 Ref P226

SENIOR PROGRAMMERS/ PROGRAMMERS

CONSULTANT PROGRAMMER required by a Time sharing bureau. Degree required plus experience of programming in APL. Area Midlands. Salary c£4,500 plus car. Ref P242

PROGRAMMER/ANALYST required for Systems 3 installation working directly under Computer Manager. 2 years' plus RPGII. Area Birmingham. Salary c£4,000 Ref. P235

PROGRAMMERS required by a Birmingham Finance House. 1 year plus Cobol. Area Birmingham. Salary range £3,500-£5,500. Low interest mortgages and loans available. Ref P234

PROGRAMMERS, 2 years' plus experience in Basic+ or experienced in other languages and willing to be re-trained in Mini Languages. Area Nottingham. Salary £4,000-£5,400. Ref P232

SUPPORT SPECIALIST required by Mini Manufacturer at least 1 year experience in Assembler. Area Birmingham. Salary to £6,000. Ref. P227

PROGRAMMER, 1 year plus PL/1 or Assembler, knowledge of Circe or IMS an advantage. Area Birmingham. Salary to £4,500. Ref. P205

LEAD PROGRAMMER. At least 4 years' experience in IBM Cobol and Assembler using DOS/VS with Cics. Area Bristol. Salary Neg. Ref P189

PROGRAMMER. 1 year plus Cobol. Area Northamptonshire. Salary to £3,500 plus subsidised mortgage. Ref P186

PROGRAMMER, 2 years' plus Cobol, preferably IBM. Area Leicester. Salary to £4,500. Ref P176

ANALYST PROGRAMMER, at least 2 years' programming in Basic + Dibol or RPG11. Area Staffs. Salary to £5.5K Ref. P32

TECHNICAL PROGRAMMER/ANALYST required by a National Software House to develope computerised type setting applications. Good working knowledge of Fortran essential. Area Birmingham. Salary to £6,000 Ref P287

SOFTWARE DESIGNER PROGRAMMERS for Computer Control, Data Switching and Office automation applications. Degree essential plus a minimum of 2 years Programming in Real Time systems. Area Nottinghamshire. Salary to £8,500 Ref P284.

PROGRAMMER/ANALYSTS required by National Company to assist existing team programming in Cobol for IBM 370 installation. Programmer with 18 months plus Cobol considered for this position. Area Nottingham. Salary to £6,000 Ref P281.

OPERATIONS

NETWORK OPERATOR, at least 4 years' experience in IBM Hardware, knowledge of Data communications and transmission with RJE network. Area Worcester or Staffs. Salary Neg. Ref. O92

IBM COMPUTER OPERATORS required for following areas: Cheltenham, Redditch, West Bromwich, Coventry, Grantham, Birmingham, Leicester, Wolverhampton. salary range £3,000-£4,000

ICL COMPUTER OPERATORS, Birmingham, Stoke, Leicester, Coventry, Wolverhampton. Salary range £3,000-£4,000

HONEYWELL OPERATORS, Birmingham, Wolverhampton, Cheltenham. salary range £3,000-£4,000

PRODUCTION CONTROLLER experienced in Job scheduling and operating ICL 1900 via Terminals. Able to use own initiative, liaison work in connection with clients and suppliers. Area Derby. Salary Neg. Ref OP110

DATA CONTROLLER required by IBM 370 DOS/VS installation. 2 years experience plus a thorough clerical knowledge of Data control. Operating experience an advantage but not essential. Days only. Area Birmingham. Salary to £4,000 Ref PO109

Our client a National Company situated near the Derby/Staffs border wish to recruit the following operational staff, in addition the company are able to offer an attractive relocation package

SENIOR OPERATIONS/DEPUTY SHIFT LEADER at least 3 years experience on 370 OS/VS plus good knowledge of J C L and IBM Utilities. 2 shift system Monday to Friday. Salary to £5K plus paid overtime

OPERATIONS ANALYST good knowledge of JCL and able to liaise with Systems Analysts. Experience of Report writing. No shifts. Salary to £3.8K

T.P. NETWORK CONTROLLER at least 3 years experience on 370 OS/VS plus good knowledge of JCL and IBM Utilities and T P. No shifts. Salary to £4.8K

OPERATIONS MANAGER. Owing to internal promotion our client requires an Operations Manager to take charge of an IBM Mainframe and Datapoint 5500 installation. Knowledge of JCL, IBM Utilities. Report writing and Liaison with Programming and Systems Department Heads essential, a formal training in Systems and Programming would be an advantage. This post offers the possibility of European travel, area near Birmingham. Salary c£6,000 Ref M27.

GRADUATES

Are you a graduate this year? If so, we have a number of clients who are recruiting Graduate Programmers and Analysts for the Midlands Areas. Salary range £3,000-£4,000.

We have many more D.P. positions on our register in all areas of the Midlands/West Country.

Contact: Graham Aston, M.E.C.I.
MARTINS COMPUTER SERVICES. First Floor, Western House, Opposite Albany Hotel, Smallbrook Queensway, Birmingham B5 4HG telephone 021-643 2111 24-hour answering service. Evenings and weekends 021-454 0331

We are now able to interview until 8 30 p.m. and Saturday morning by appointment.

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SHIFT LEADER

A minimum of eighteen months experience IBM 370/DOS/VS. Good promotion prospects, free Life Assurance, Pension Scheme. Three shift system. SURREY - £4500

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Senior Operator with one year plus experience, IBM System 3. A knowledge of programming prefered. Four weeks holidays, L.V's. Days only. W.1. £4200

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ICL 1900 Operator with one year GII and manual experience. Excellent promotion in this fast growing company. Pension Scheme, L.V's. Three shift system. KENT - £3200+

SENIOR OPERATOR

International company require an IBM OS MVT HASP Operator with five years experience. Staff canteen, four weeks holidays. Three shift system. MIDDLESEX - £4500

These are just a few of the vacancies we have available.
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Telephone 01-402 0933
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SOUTH AFRICA

Analyst/Programmers

Salary to 10,000 rands

Our client, a subsidiary of a well-respected British Manufacturing Group, seek two additional Analyst/Programmers to augment their team. They have centred their data processing interest around ICL 2900 series equipment and their Head Office and Data Processing Department is located on the **coast** at Port Elizabeth. These positions are of a permanent nature and would involve the successful applicants working with a small dynamic team of computer professionals in a real-time systems environment.

Candidates should ideally have:

Three years' COBOL experience plus a basic knowledge of systems design and a willingness to deal with and guide user department personnel.

Excellent large company benefits apply to these positions, including full relocation expenses and travel expenses.

For additional information contact:

DAVID G. WADE on 061-833 0427
Outside normal working hours on 0785-56013
Ref. No. CW/6/2

[illegible]

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35-37 Great Charles Street Queensway, Birmingham B3 2BR
MANCHESTER 061-833 0427
Freepost, Blackfriars House, The Parsonage, Manchester M3 8BB
LONDON 01-935 0671
Freepost 6, 102, Blandford Street,
London W1E 1J7

Computing Services Association

Pick up a name you'll never drop

(except perhaps at interviews!)

ANALYSTS & PROGRAMMERS

Throughout the world, the Rolls-Royce name is equated with all that denotes excellence in technical innovation, design and manufacturing, plus adherence to high standards in every sphere of operation.

To be part of it means the opportunity to work in a sophisticated environment backed by technical resources and personal development programmes which are respected world-wide. This statement is no less true in the Business and Technical Systems functions where in order to mount highly complex design and manufacturing programmes to power the aircraft of tomorrow an increasing emphasis is placed on computer based control and information systems covering production, engineering, product support and financial areas.

As part of our development plans we now offer Programmers and Analysts of various specialisations and levels of experience the opportunity to join our Business and Technical Systems teams working at most Aero Division locations which include Bristol, Derby, Coventry, Watford and Glasgow. You will be working with IBM system 370, Cyber 74, and DEC 10 computers. Control Software used includes MVS, SVS, TSO, IMS, DOS, CICS. A generous relocation package is available and housing is considered reasonably priced in most areas mentioned.

Now we'd like you to pick up where we've left off. Here is a check list. Fill it in and return it to us Freepost – we'll be in touch.

Just tick your amount of experience in the job categories listed, indicate the mainframes and systems you have worked under and your preferred locations:

YEARS EXPERIENCE	0-1	1-2	2-3	3 PLUS
SYSTEMS PROGRAMMING				
APPLICATIONS PROGRAMMING				
DATA BASE PROGRAMMING				
SYSTEMS ANALYSIS				
DATA BASE ANALYSIS				

TYPES OF COMPANY EXPERIENCE	
COMPUTER MANUFACTURER	
SOFTWARE HOUSE	
COMPUTER BUREAU	
CONSULTANCY	
GENERAL USER	

CURRENT JOB TITLE

MAINFRAMES & SYSTEMS USED

PROGRAMMING LANGUAGES USED

LOCATIONS PREFERRED: CW2

DERBY ☐ BRISTOL ☐ WATFORD ☐

COVENTRY ☐ GLASGOW ☐

NAME (Mr/Ms)

TEL. NO. DAY / EVENING

ADDRESS

Please return, now, by FREEPOST – you don't need a stamp – to: John Buckingham, Personnel Department, Rolls-Royce Limited, Aero Division, FREEPOST, 65 Buckingham Gate, London SW1E 6AT.

ROLLS ROYCE

ROLLS-ROYCE AERO DIVISION

Ministry of Agriculture Fisheries & Food
Fisheries Laboratory, Lowestoft, Suffolk

Computer Programmer

■ Provide programming assistance to scientists engaged in biological and physical oceanographic projects ■ Write, test and document programs for an area of research from program specifications ■ Work with 2 HP 2100 computers and terminals to ICL 1904S ■ Take part in research cruises.

☐ Good hons degree in appropriate subject ☐ Experience of ICL 1900 or HP 2100, and a knowledge of FORTRAN and COBOL advantageous ☐ Final year students considered ☐ Age normally under 27 ☐ Appointment as Scientific Officer (£2840–£4410) ☐ Ref SB/36/AD.

■ *For application form see below.*

British Museum
Research Laboratory

Computer Scientist

■ Use Hewlett Packard mini computer in support of dating techniques and physicochemical analysis in the laboratory's scientific work ■ Develop application programmes for either scientific research or information retrieval systems ■ Liaise with Museum staff in the planning and implementation of new computer projects.

☐ Good hons degree or equivalent in a numerate discipline ☐ Some computing experience essential ☐ Knowledge of scientific computing/information retrieval advantageous ☐ Age normally under 30 ☐ Appointment as Higher Scientific Officer (£4560–£5910) or Scientific Officer (£3300–£4880) according to qualifications and experience ☐ Ref: SB/5/DJA.

■ *Application forms (for return by 23 June 1978) write to Civil Service Commission, Alencon Link, Basingstoke, Hants, RG21 1JB, or telephone Basingstoke (0256) 68551 (answering service if office closed).*

Science Group CIVIL SERVICE

CAREER OPPORTUNITIES WEST MIDLANDS

Owen Computer Services based at Darlaston provide a computing facility for the Rubery Owen Group of engineering companies located in the West Midlands and North West of England. A central Univac mainframe is currently utilised, and plans to extend its range through on-line links to remote mini computers and terminals are well advanced

The following vacancies exist in the Development section

Systems Consultant c. £6,500 p.a.

This senior position involves investigation into all aspects of group companies' systems, the formulation of systems and computing development plans, equipment evaluation and managing data processing projects in conjunction with our clients' management. Ideally applicants should have a degree or professional qualification and experience in a senior data processing position with a manufacturing organisation.

Project Leader c. £6,500 p.a.

Initially to manage the implementation of a computerised General Ledger and Financial Reporting System throughout the Group. Applicants must have had experience in controlling computer projects, with desirably an accounting background, or experience in the development of computer systems in the financial area.

Systems Analysts c. £5,000 p.a.

To carry out analysis and design of systems in a project team environment. We are currently involved with manufacturing systems, both batch and interactive, communications with mini computers, systems development on minis and commercial batch systems on the mainframe. Applicants should have had previous experience in systems analysis, and communications or mini experience would be an added advantage.

Senior Programmer c. £4,500 p.a.

At least two years' experience of developing COBOL programs. Experience of on-line systems or DATABUS language would be an added advantage.

Programmer c. £4,000 p.a.

At least one year's experience of developing COBOL programs.

All positions offer interest and responsibility in a pure development environment with 31 days paid holiday; generous pension scheme, plus large company fringe benefits. Assistance towards relocation will be provided where necessary.

Write or telephone for further information or an application form to Mrs. Irene Clapp.
Personnel Department
Rubery Owen (Darlaston) Ltd.
P.O. Box 10, Wednesbury, West Midlands WS10 8JD.
Phone: 021-526 3131, Ext. 569

RUBERY OWEN RO

Gemini Contracts

EURO UK

contract opportunities for experienced programmers

—Register with an International Software Organisation

Telephone 01-828 6634
or evenings 0908 562745

ASTMS

— the union for software staff, is currently holding a series of discussions on employment prospects in the industry.

The next meeting will be for CAP employees and will be held at

The White Lion
Northington Street
London, WC1
at 5.30 p.m.
on June 6, 1978
Speaker
ASTMS National Officer
Tim Webb

EUROTECH BELGIUM S.A.

A member of the Cable and Wireless Group, requires for its Brussels-based communications centre

PROGRAMMERS

C. £8,000 - £12,000

& cost of living indexing

& one month's salary annual bonus

& extra ¾ month salary holiday pay

& overtime pay

& 20 days' annual leave (plus 12 public holidays)

& luncheon vouchers

& the successful applicants will be eligible to apply for tax concessions.

Applicants should have experience in communications preferably message switching on mini or micro computors and be familiar with Assembler programming.

Please write or telephone for more details and an application form to

The Administration Manager
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191/197 Boulevard du Souverain
1160 Bruxelles
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Tel: Brussels 02/660.49.50

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Are you limited by the power of your processor? Many specialists in this field are frustrated by the restrictions of the processors specified for their systems.

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Sperry Gyroscope is a major supplier of civil and military message handling systems. New projects under development will keep us at the technological forefront with systems supplied worldwide. We intend to consolidate our leadership by expanding our existing team of specialists and we are seeking people with relevant experience in:

- **Software**
- **Hardware**
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- **Draughting & Design Draughting**

We are an unusually diversified, high-technology organisation and we offer large company benefits with the advantages of small working groups in a multi-discipline environment.

If these challenging new opportunities interest you, please telephone or write outlining your career to date and emphasing any message handling or related experience, and quoting ref DT/1678, to:

Elon Flint,
Personnel Officer,
Sperry Gyroscope,
Downshire Way, Bracknell,
Berks RG12 1QL.
Tel: Bracknell (0344) 3222.

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DEVELOPMENT ASSISTANT

Systems

Newcastle-upon-Tyne up to £5696

Based in the Engineering Division at Regional Headquarters, Killingworth. The man or woman appointed will be a member of a small team which is responsible for analysing the computing needs of the Engineering Division especially for Grid Control and the Communications and Instrumentation Section.

The team is responsible for the running of a number of IBM System 7 computers which are used for telemetry monitoring and for controlling the VHF radio network. The successful applicant will be expected to develop programmes for both these functions in Assembler and FORTRAN.

Applicants should have had some experience of real time computer applications ideally backed up with a degree in engineering, mathematics, or computer sciences.

Salary within the range £4799-£5696 inclusive of supplements.

Application forms, quoting reference EI 145R are obtainable from:
Northern Gas
Personnel Division
PO Box 1GB
Newcastle-upon-Tyne NE99 1GB
Telephone (0632) 685882
Applications to be returned by
15th June 1978

NORTHERN GAS

LONDON BOROUGH OF BROMLEY

SYSTEMS ANALYST

AP.5 £4,630 - £4,900
inclusive (REF. B.279)

The post is in the Borough Treasurer's Department, which operates an ICL 1903T computer running under the George 3 operating system, with terminals and VDUs.

The work is of a varied nature and there is opportunity to become conversant with the many differing applications, both financial and non-financial, in the local government field. The successful applicant will initially be involved in assisting with the design and implementation of a new budgetary control system with provision for on-line VDU facilities

Applicants should have been educated to University degree standard or have five G.C.E.s with two at "A" level standard. They should have also undergone formal training (ideally obtaining the NCC certificate in systems analysis) and have had at least three years' experience in the development and maintenance of computer systems.

For further information please telephone the Computer Development Manager on 01-464 3333, Ext 3265

Application forms from Assistant Chief Executive (Manpower) Town Hall, Bromley BR1 1SB. Tel. 01-464 3333. Ext 3316. Closing date 7th June 1978

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BOC Datasolve is the largest independent Computer Services bureau in the U.K. At our Sunbury Data Centre we're looking for IBM experienced staff to operate our Amdahl 470 V/5 configuration operating under MVS software and handling a large and varied workload that is increasing all the time. We will also consider training those who can demonstrate an aptitude for this type of work.

This is an excellent start for anyone who wants to progress into systems programming, technical services, operations management, or sales and marketing.

As well as a good starting salary we'll give you the opportunity of overtime, together with four weeks' holiday and luncheon vouchers.

We are also interested in hearing from you if you have operating experience in an IBM TP environment.

If you're interested please phone Doug Hazell on Sunbury 85566 or write to Ros Baker at:

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BOC Datasolve Limited,
99 Staines Road West, Sunbury-on-Thames,
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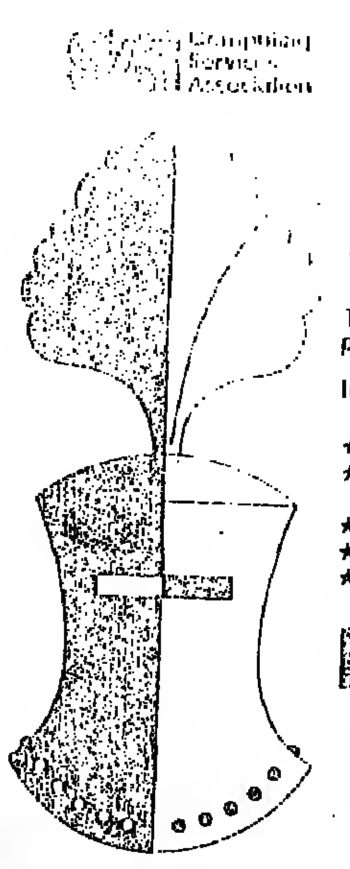

Database Systems **Cobol Development**

Due to the development and redevelopment of their advanced computer systems, our client, with a successful DP services dept., wishes to boost its programming team. Currently retaining large ICL 1900 equipment running under GII, they offer excellent opportunities for persons with minimum 2 years' ICL COBOL experience to become engaged in the implementation of commercial and financial applications as senior programmers. Candidates should have PLAN experience.

This well known organisation is currently involved in the implementation and further development of IDMS database for one of their financial systems, offering persons who have reached a stalemate in their present company the opportunity to broaden their programming experience.

In addition, a competitive salary is being offered besides 6 weeks' holiday, subsidised restaurant and excellent sports and social club.

- ★ Opportunity to express leadership capabilities
- ★ Opportunity to progress into analysis and secure a good career path
- ★ Opportunity to learn IDMS Database
- ★ Opportunity to develop COBOL
- ★ Development of variety of applications

- ★ Close to EUSTON/KING'S X station
- ★ Competitive and progressive salaries
- ★ 6 weeks' holidays!
- ★ Flexi hours
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- ★ Subsidised restaurant
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EUROPEAN OPPORTUNITIES

PROGRAMMER BELGIUM

Our client is a major organisation providing comprehensive marine engineering and construction services to companies engaged in Hydrocarbon development. Retaining IBM 370 under DOS/VS they seek a person with 4 years' COBOL exp. with PL/I, RPG or ASSEMBLER an asset. Co. offers

- ★ Variety of projects in rapidly expanding co.
- ★ Centrally based — BRUSSELS.
- ★ English speaking environment.
- ★ Settling in allowance for married or single persons.
- ★ Salary approximately £18,000 p.a.

REF. 1474

PL/I PROGS HOLLAND

Our client, a major and successful concern, wishes to strengthen its European programming team. Retaining IBM 370 hardware under DOS/VS. Co seeks ambitious person with PL/I CICS or COBOL an asset Co. Offers:

- ★ Involvement in development of new projects.
- ★ Opportunity to work with an expanding organisation operating worldwide
- ★ Centrally based — Amsterdam.
- ★ Salary 40,000 Guilders (£10,000) cost of living allowance and relocation expenses.

REF. 1212

IBM PROGS HOLLAND

Our client, an American publishing company, has vacancies for COBOL programmers with at least 3 years' experience for their office in Amsterdam. The company retails IBM 370 hardware and the successful applicant will be involved in a variety of commercial applications. Co. offers

- ★ Excellent working conditions.
- ★ Greater career prospects in this progressive organisation
- ★ English speaking environment.
- ★ Salary 40,000 Guilders (£10,000)

REF 1503

ANALYST PROG HOLLAND

Our client, an international engineering company, retaining IBM 370 hardware seeks an analyst programmer with minimum 3 years' COBOL experience CIC VS would be an advantage. The company is situated in an historical University town close to the Dutch/German border. Co offers

- ★ Relocation expenses
- ★ Working in a new modern complex
- ★ Excellent career prospects
- ★ Salary 40,000 Guilders (£10,000) + Bonus

REF. 1473

FOR FURTHER DETAILS PHONE OR WRITE TO OUR LONDON OFFICE, 01-734 0152/3010. 24 HRS

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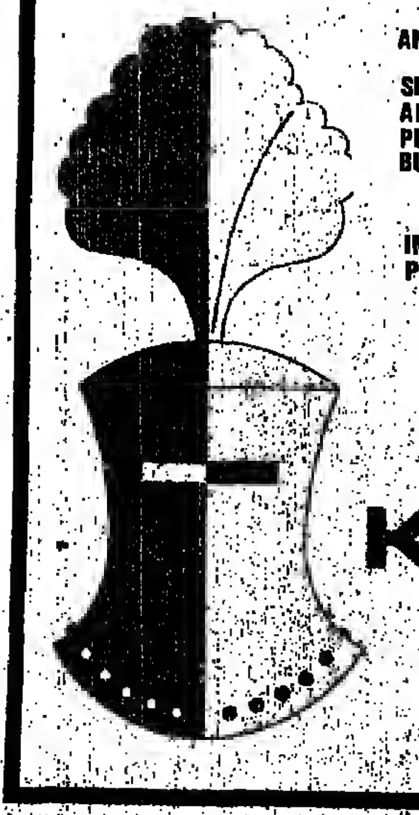
CONTRACT DIVISION



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AN/PROGRAMMERS PL/I FRENCH SPEAKING	PARIS	£300 p.w.
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IMS/DL/I DESIGNERS AND PROGRAMMERS	N.W. LONDON	to £240 p.w.
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PL/I OS	CITY	£190 p.w.
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OFFICES AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

INTERNATIONAL BANK

CICS/VS Systems Programmer

CIRCA £6,000 plus low interest mortgage and annual bonus schemes

Our client is a major International Bank, currently engaged in an extensive programme of systems development in both the batch and on-line areas, on IBM 370 mainframes.

An important part of the on-line development is a middleware system which provides an interface between CICS/VS and on-line applications. This system is currently in its first phase of development and a vacancy exists for an Assembler Programmer, with CICS/VS application experience, who will be responsible for the support and future expansion of this system.

This position will involve working in the Computer Technical Support Group, and is likely to appeal to someone who is interested in progressing into systems programming in a teleprocessing environment with future involvement in all aspects of systems support. A knowledge of VSAM and DOS/VS, while not essential, would be an advantage.

An attractive salary will be paid and in addition there are substential fringe benefits which include an annual bonus, low cost mortgage facilities, non-contributory pension and life assurence schemes, private medical insurance and season ticket loan. Ref. CW/1590.

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SYSTEMS ANALYSTS

Rural Staffordshire

Salaries to £6,250 p.a.

Our Client, a major force in British industry, has a medium-scale installation handling both intelligent and non-intelligent local teleprocessing. Significant future systems development will be supported by new generation hardware.

Financial Systems Analyst

Candidates should ideally have experience of financially based systems combined with a programming background, preferably in COBOL.

Manufacturing Systems Analyst

Candidates should have a working knowledge of manufacturing systems combined with real-time and/or programming experience preferebly gained in COBOL.

Our Client offers excellent benefits including: pension schemes, subsidised lunches, sports and social facilities, etc. Contribution towards re-location expenses is available where applicable. For further details, please contact.

RICHARD CHAMPION on 021-236 3781

Ref. CW/6/1

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BIRMINGHAM 021-236 3781
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MANCHESTER 061-833 0427
Freepost, Blackfriars House, The Parsonage, Manchester M3 8BB
LONDON 01-935 0671
Freepost 6, 102, Blandford Street,
London W1E 1JZ

Computing Services Association

SENIOR SYSTEMS PROGRAMMERS AND TECHNICAL ANALYSTS

1978 looks like being a boom year for the British computer industry. The opportunities for the senior computer technician are once again increasing and it is again possible to pursue a computing career without the time-honoured move into management necessarily coming into question. Not that there is anything wrong with management: it is merely that the men and women we want, just at the moment, are those who will prefer to go on working as technicians, at least for a while, and we in Zeus-Hermes always regard this as a perfectly viable career pattern.

We are now looking for systems programmers at a senior level who started in software or technical applications programming about 1967-72 (or whose competence allows them to pass as such) and who want to stay in it without being pushed into management and without suffering in any way for this preference.

Salaries up to £7,500

Tony Fidler, Data Search, 53 Victoria Street, London SW1. 01-222 2022 (Day or Night)

Data Search

a member of the Search group

SYSTEMS ANALYST £5,500 PROJECT LEADER £6,380

THE COMPANY Longman Group Limited is one of the largest and most successful commercial educational publishers in the United Kingdom and has substantial worldwide interests through its associated and subsidiary companies.

THE DEPARTMENT AND EQUIPMENT The Computer Services Department currently has an IBM 370/135 computer, and operates a full range of systems including on-line order entry, royalties, invoicing, warehousing and management information. Two PDP-11/34 mini computers were installed recently and subscription accounting and text processing systems are in process.

THE ANALYST A minimum of one year's experience as an Analyst is essential. A programming background would be preferred and candidates must be educated to at least 'A' level. Preference will be given to men/women who can demonstrate completion of at least one major system, and who have a knowledge of IBM equipment.

THE PROJECT LEADER Preference will be given to candidates who have previous experience at Project Leader level but applications will be considered from Analysts who have a minimum of three years' experience, who can demonstrate supervisory ability, and who can demonstrate completion of at least two major systems.

LOCATION Both positions are located at our modern offices premises within the Distribution Centre at the Pinnacles in Harlow. Relocation expenses will be paid where appropriate.

BENEFITS Working conditions are good, and benefits include four weeks annual holiday, subsidised staff restaurant, sports and social club etc. Training needs for staff are assessed annually and follow-up facilities are good. A contributory pension scheme is operated.

THE APPLICATION For further details and an application form please write or telephone:

Mr. F. Webster, Personnel and Training Officer, Longman Group Limited, Pinnacles, Harlow, Essex. Tel: Harlow (0279) 29655.

Longman

NATIONAL INSTITUTE OF AGRICULTURAL BOTANY

DATA PROCESSING SUPERVISOR

To supervise a small data preparation section producing punched cards and paper tape operating a teletype terminal.

Data derived from crop variety trials and requires statistical analysis on a CTL modular one computer at N.I.A.B. or on I.C.L. and I.B.M. mainframe computers at remote installations. Preferably candidates should have qualifications in computer science or in mathematics with statistics to H.N.C. level and at least 2 years' experience of Data Processing. Some supervisory experience is desirable but not essential.

The appointment will be on the Scientific Officer Grade. Salary Scale £2882-£4032 (plus Phase 3 pay supplement under negotiation), commencing salary would depend on qualifications and experience.

Further particulars and application form from the Establishment Officer.

NIAB, Huntingdon Road, Cambridge, CB3 0LE
Tel: Cambridge 76381, Ext. 234 (quoting ref. S.V.281)
Closing date June 9, 1978

PROGRAMMERS

P.D.P. RX x 11

Preferably with real time experience London area. Lots of prospects.

Tel: Penny Bailey on 01-402 9355

ICL 1900 GII SHIFT LDR **£4200**
Minimum 2 years' exp. required for this N.E. London Installation. 2 shifts only. Perks include free meals.

IBM 370 OS SENIOR OP
Central London based financial Installation requires OS OPS with 2 years' exp and some JCL knowledge. Excellent career prospects.

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2 years+ exp. in Data Control, plus a good working knowledge of JCL. Good career prospects plus Season Ticket Loans and free BUPA

ICL	GII	SNR OP	10 mths+	N. LONDON	£3600
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IBM	DOS	OPERATOR	1 yr+	C. LONDON	£3800
IBM	OS	OPERATOR	1 yr+	C. LONDON	£4000
IBM	OS	OPERATOR	1 yr	CROYDON	£3700
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UNIVAC	OS3	OPERATOR	8 mths+	CITY	£3000
PDP DEC 10		OPERATOR	1½ yrs	C. LONDON	£4200
HONEYWELL	GCOS	OPERATOR	1 yr+	C. LONDON	£3500
DATA CONTROLLER/ TAPE LIBRARIAN				CROYDON	c£3500
SENIOR DATA CONTROLLER—IBM				C. LONDON	c£3600
TRAINEE OPERATORS				ALL AREAS	c£3300

Plus many more positions also available

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[illegible] House
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London W1R 7FB
24 hours [illegible]

Programmers & Analysts
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At the moment we need mobile professionals with varying degrees of experience.

PROGRAMMERS

COBOL PROGRAMMERS · BASIC PLUS PROGRAMMERS · IBM ASSEMBLER PROGRAMMERS · PDP11/MACRO11 PROGRAMMERS.

also PL/1 HONEYWELL TDS, IMS/DL1 and D.DBDC

however, whatever your computer work background, we want to hear from you.

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Mainframe and Mini experience with particular emphasis on people able to control a team of programmers and manage all aspects of our customer contact.

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Marcol Computer Services
Limited, 60 Queens Gardens,
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Computing Services Association

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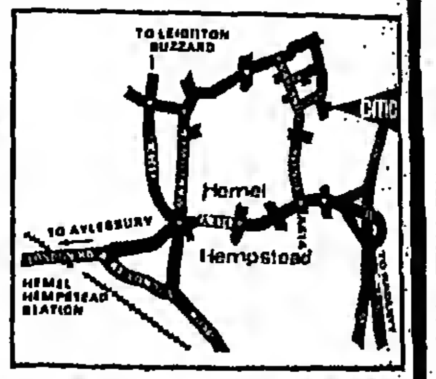
We will be holding informal open evenings at our Factory and HQ at Hemel Hempstead where we can discuss your own experience and tell you about what we do. If you are interested we can arrange a more formal interview at a later date

OPEN EVENINGS: TUESDAY, JUNE 6th; WEDNESDAY, JUNE 7th, 5 p.m. until 10 p.m.

This is where you will find us:



For more information please telephone Hemel Hempstead 61266, reverse the charges and ask for Doris Cannon on extension 220, or write to her at the following address

Computer Machinery Company Limited
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Programmers **to £5,500 p.a.**
At least a year's experience of System Ten ASSEMBLER and probably 3 years' general DP experience.

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Fluent System Ten ASSEMBLER with Analysis/Design experience on at least one successful project and probably with 5 years' general DP experience.

Project Leaders **to £8,000 p.a.**
Should have had full responsibility for the design, production and implementation of at least one major System Ten project, with probably 7 years' general DP experience.

Experience of one of the following will be of particular interest:
Inventory and Production Control
Hotel Reservations
Insurance Broking
Sales Order Processing and
Ledger Accounting
Communications Software

Ref: 519/CW/Renée Nute

To apply for any of the above positions or for further information, please telephone or write to Renée Nute on 01-242 9356. If it would be more convenient to telephone in the evening, the telephone number is: 01-874 6372.

Computing Services Association

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Systems Design and Programming for Online Systems

1900 2900 VME/B VME/K

The specialists in online systems are seeking experienced systems designers and programmers at all levels for our

Oxford, West London, Manchester, Dublin, European and Overseas Project Centres

for interesting and challenging opportunities to work on clients' online transaction processing systems.

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able to lead our own and client programming teams on online projects.

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to take full project responsibility.

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experience in the design and implementation of online systems.

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to market software products and services for Online Systems.

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We offer
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- Variety of applications
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We have our own 2904, and a 2950 on order . . . we are growing fast. We shall double in size again this year. Telecomputing is now providing advisory, training and implementation services for installing online computer systems around the world.

If you would like the opportunity to get into the area of online systems or you already have online experience on which you wish to build, please write or phone.

Telecomputing Ltd, Seacourt Tower, West Way, Oxford OX2 0ED.
Phone Oxford (0865) 723621 (daytime) or 01 866 9094 (evenings).

ata Computer Recruitment

A division of ATA Selection and Management Services, recruitment consultants to Industry and Commerce since 1965

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At present, they run a 64K ICL 1901T with GEORGE II and communications via 7502s with T.P.S. Real-time monitor. Consideration is being given to a new range of hardware to be installed within eighteen months.

PROJECT LEADERS

will preferably have a degree or H.N.C. Highly motivated, self-starting D.P. professionals are required for these positions. Five years' D.P. experience in Systems and/or COBOL programming is essential, coupled with the ability to manage other D.P. staff, and communicate effectively with all levels of user management.

SENIOR ANALYST/PROGRAMMERS

will be potential Project Leaders with three years' Systems and/or COBOL programming experience.

This part of South Wales is particularly attractive with the Brecon Beacons, the Wye Valley, and the Forest of Dean all within half an hour's travelling distance.

Sports and Social facilities are excellent with Sports Centres in many of the surrounding towns. Housing is varied and extremely competitively priced, both in urban and rural areas.

The company offers a good staff purchase scheme on Group products, and salaries as follows:

PROJECT LEADERS c.£5,100
SENIOR ANALYST/PROGRAMMERS c.£4,400 + overtime

In addition, generous removal and disturbance allowances can be paid.
For further details telephone our Bristol Office. 0272 211035
Written applications enclosing detailed résumé to:
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280 Gt. Portland St. W1N 5HG

MANCHESTER (061) 832 5956
86 Cross St. M2 4LA

BIRMINGHAM (021) 643 1994
Woolworth Building, 102 New St. B24HQ

BRISTOL (0272) 211035
Equity and Law Building
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Operations Staff

...your career takes off here in Reading up to £5870

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Shift Leaders–up to £5870
Team Leaders–up to £5003
Senior Operators–up to £4353
(salaries inclusive of shift allowance).

Using ICL 1904S, 2903, 2904 and System Ten you will:

- Provide a communications based George 3 service for development support and maintenance of 1900 order code software.
- Service commercial workloads for the Software and Literature Distribution Centre.
- Create tailored software libraries and executives for all ranges of ICL machines.

We need to take on people with experience of at least 2 of the following:

- GEORGE 3 – preferably 8.63.
- E6RM exec. – ops. exec. on a 1900
- E3RM exec. – ops. exec. on 2903
- GEORGE 1 – or Dataskil's GEORGE 1+.
- GEORGE 2 – or Dataskil's GEORGE 2+
- SYSTEM TEN.

We operate an attractive shift system (no Saturday nights) and you will be able to enjoy our full range of large company benefits like our generous relocation package if you need to move.

Give your career a lift
Ring Dave Crowe the Computer Facilities Manager or Phil Wilcox the Chief Operator on Reading (0734) 595711 or write to ICL, quoting reference CW1859, 60 Portman Road, Reading, Berks RG3 1DR.

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Think computers – think ICL.

ICL

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For enthusiastic highly [illegible] young man with professional [illegible] [illegible] experience [illegible] years experience [illegible] supervisory level in commercial [illegible] Would [illegible] [illegible] machines

Please Ray Scott on Cambridge [illegible] Cambridge 49917, or write to [illegible] 3N Pleasant [illegible] [illegible] Cambridge

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LEICESTER

POLYTECHNIC

Tenders are invited for the [illegible] of a Mini-Computer System for teaching undergraduates on B.Sc. and B.Sc. (Hons.) Computer Science and HND Computer Studies in the School of [illegible] matics Computing and [illegible]

Further details and tender [illegible] ments, which are to be [illegible] by 19th June, are obtainable [illegible] the Secretary, Leicester Polytechnic, P.O. Box 143, Leicester [illegible] 9BH.

Computer Engineers

We have vacancies for microcomputer control engineers experienced in the hardware and software aspects of microprocessors and minicomputers.
Our business is in the real-time control of industrial equipment and manufacturing processes.
Applications are invited from electronic/computer engineers (male or female) with two or more years experience qualified preferably to degree level.
We can offer large company benefits with the advantages of working in a small unit.
On receipt of a brief outline giving age, qualifications and experience we will ask applicants to complete a form in detail.

Apply to: The Personnel Manager,
Lucas Group Services Limited,
Logic Systems Division,
PO Box 34,
Highlands Road,
Shirley, Solihull,
West Midlands.

Lucas

UNIVERSITY OF LIVERPOOL

Computer Officer

Applications are invited from suitably qualified persons for the post of Computer Officer in the Department of Mechanical Engineering.

The department maintains a Computer Laboratory and the Computer Officer is responsible to the department chairman for running the facilities which comprise a multi-terminal system with disc store and graphics, a research micro-processor and four mini-computers. Duties encompass a wide range of varying areas, including some teaching, advice on programming and software development.

Initial salary within range £3,189-£6,178 per annum.

Applications (3 copies), together with the names of three referees, should be received not later than 22nd June, 1978, by the Registrar, The University, P.O. Box 147, Liverpool, L69 3BX, from whom further particulars may be obtained. Quote Ref. RV/795/CW.

Mansfield District Council

TECHNICAL ASSISTANT

(Computer) Grade AP 2/SO 1
(£2983-£5085 per annum inclusive of supplement)

Applications are invited from persons with programming experience in Cobol for the above post in the Finance Department. The Council at present operate an ICL 7020 terminal attached to 1904S mainframe at Nottinghamshire County Council but both Authorities are actively considering an upgrade in the near future. The successful applicant will join a small section in the maintenance and expansion of mainly financial systems and will be expected to perform certain computer consoling and operation functions from time to time.
Application forms and job descriptions may be obtained from the undersigned and should be returned to him not later than 12th June, 1978.

Mansfield District Council
Department of Finance

ACCOUNTANCY ASSISTANT

Grade AP 4 (£3291-£4214) per annum inclusive of supplements

Applications are invited from persons [illegible] qualified to the [illegible] standard of the [illegible]. Duties of the post include the responsibility for the [illegible] of the Council's Loans [illegible]. Applicants must be able to work with minimum of supervision.
Application forms and job descriptions may be obtained from the undersigned and should be returned to him to arrive not later than 12th June, 1978.
Canvassing of members of the Council by any Committee directly or indirectly will disqualify the candidate concerned and applicants should also disclose any relationship to a Senior Officer or member of the Council.

C. Evans, Head of Personnel and Management Services, [illegible] Mansfield [illegible]

Data Controller

We require a Data Controller to work in our Staff and Accounts Department operating and up-dating various Personnel and Management Accounting programmes. A basic knowledge of administration systems and absolute discretion in dealing with confidential matters are essential while previous experience with computer terminals and card punches is desirable.

The salary envisaged will be in the region of £3700-£4000 p.a. depending on experience.

Apply giving details of age and experience to:

W. C. W. Hood,
BINNIE & PARTNERS,
Artillery House,
Artillery Row,
Westminster,
London SW1P 1RX
Telephone: 01-222 7755

SHOPPING AROUND?

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We have a 1 megabyte IBM 370/145 operating under DOS/VS, with a 3031 on order. We use COBOL and ASSEMBLER with DL/1 as our database language.

We are currently developing and enhancing several major systems including

- ★ **An Integrated Payroll/Personnel Data Base**
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- ★ **Budgetary Control**
- ★ **A Merchandising System using Data Base**

This expansion has created new positions and we are now looking for the right people to fill them.

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- ★ **Free lunches**
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We are close to Baker Street, Edgware Road, and Marylebone Stations.

If you match the general requirements outlined, then contact Linda Bensted on 01-836 6775 or write to her at

Computer Personnel International
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Senior Systems Analysts to £7,350

We have two vacancies for people with proven data processing experience who have the potential to deputise for Project Managers.

They will be expected to lead teams of Analysts and Programmers in one of the development areas mentioned.

Systems Analyst to £6800

This vacancy would suit a person who has had both programming and analytical experience and can demonstrate the implementation of at least one project.

The successful applicant will have ample opportunity to utilise his/her analytical abilities.

Deputy Chief Programmer to £6350

This job would be ideal for a programmer with sound experience who has the ability to assist the Chief Programmer in managing the Programming Group.

In addition to writing the more complicated programs he/she will be expected to be heavily involved in the day-to-day control of the Group, as well as the implementation of new techniques such as interactive programming.

BRITISH HOME STORES Prova

ELECTRONICS ENGINEER/ PHYSICIST

The Central Electricity Generating Board is looking for a suitable person to join the staff in the Scientific Services Department at Wythenshawe, South Manchester.

The successful candidate will become part of a small group developing and applying computer techniques to the measurement, analysis and display of data from power station plant.

Applicants should have a good honours degree or Ph.D. in electronics or electrical engineering, physics or computing science. Experience of research and development involving mini-computers, computer hardware, real-time computing or display methods will be an advantage, but recent graduates and/or persons graduating this year will also be considered. An interest in computer programming is essential, although extensive experience is not necessarily required.

Starting salary will be within one of the following two ranges depending on qualifications and experience: £3635-£6175 per annum or £6665-£7221 per annum.

Applications in writing, from either sex, giving details of age, qualifications, experience, etc., to the Personnel Manager, C.E.G.B., Europa House, Bird Hall Lane, Cheadle Heath, Stockport, Cheshire SK3 0XA, to arrive no later than 21 June, 1978. Please quote vacancy number 51/CW.

UNIVERSITY OF ABERDEEN

DIRECTOR

UNIVERSITY COMPUTING CENTRE

Applications are invited for the post of Director of the University Computing Centre which falls vacant on 1 July, 1978. The Centre has a dual processor Honeywell 66/80 System, one of the largest installations in the United Kingdom Universities, with a considerable commitment of data base activity comprising the provision of a user service, the development of related software and data base research projects.

Salary within Range IV, Other Related Staff.

Further particulars from The Secretary, The University, Aberdeen, with whom applications (2 copies) should be lodged by 28 June, 1978.

Computer Appointments

TELECOMMUNICATIONS LONDON

SENIOR SOFTWARE PROGRAMMER c. £8,000

Five years' experience on minis, and experience of message switching would be perfect. Few of us are perfect however, so 3+ years mini experience (DEC, GA, Texas Instruments for example) would be of great interest.

SERVICE ENGINEERS c. £6,500 + car

Most importantly, you will need good mini experience and peripheral knowledge. Training will be given on the company's particular comms. package, and the processor which controls it.
Our client is a small but vibrant subsidiary of a world leader in communications; marketing a package using the Texas Instruments 990/10 processor controlled, Message/Data Switch.
The above are Top-Grade positions and the company is prepared to pay the price for Top-Grade people by offering:

★EXCELLENT NEGOTIABLE SALARIES
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ACT NOW: RING ROLAND JONES ON 01-439 6299. REF. RJ 1074

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BURROUGHS SL3 or SL5 PROGRAMMER up to £6000

London SW1

Here's an opportunity to use your TC 500 or 3500 expertise, with a DEFINITE CHANCE TO PROGRESS TO IBM PL/1 OR COBOL.

Additionally, the job offers

- **the stimulation of user contact**
- **scope for initiative**
- **career development in an advanced 370 environment, with TSO, database and real-time commercial applications.**

We are recruiting on behalf of clients, a major International Company situated close to Victoria Station. Relocation costs will be paid where applicable, and valuable fringe benefits are available. Please ring us for a confidential discussion about this first-class career opening, quoting ref. 832. Alternatively, leave a message on our answering machine after hours or write briefly.

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EDP Systems
52-53 Margaret Street
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The HODGE GROUP is one of the Country's leading national finance houses with major interests in instalment credit, banking and insurance.

The Group's Computer Services Department, which is currently expanding its operations, wishes to appoint Programmers to contribute towards the development of advanced new systems and techniques relating to applications throughout the Group.

Candidates should have a minimum of one year's programming experience, preferably COBOL. Previous involvement with ICL software would be an advantage.

This position offers the successful candidates, male or female, a challenging opportunity to develop within a professional department which is part of a large and progressive Group.

A comprehensive package of benefits will be offered including

- ★ a competitive salary
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- ★ assistance with relocation expenses where necessary

Please write or telephone, in strict confidence, for further details to

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The Hodge Group Limited
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OPERATORS **£4042 +**
18 months' ICL or IBM experience of GEORGE III or OSVS1. Excellent promotion prospects through to Shift Leader (£5,000+) and programming. Very good company benefits. London Ref. 292

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Thorough knowledge of OS JCL, MVS, MFT or MVT, mature and capable. Essentially management potential. Excellent shift system. Good career prospects. Shift Leaders, Senior Operators/Operators also required for current expansion phase. London. Ref. 296

SHIFT LEADER **£5,200**
A very good background in DOS-VS/POWER/CICS is required for this position with a large city based organisation, running a 3 shift system. Many company benefits. London. Ref. 213

SYSTEMS PROGRAMMER **to £6,000**
A person with a very good technical and practical IBM background, preferably DOS, together with Assembler/Systems Programming experience is required for this product specialist position. The successful applicant must be prepared to travel throughout the world. Ref. 297

PROGRAMMER **to £7,000**
ICL experienced 2900 programmer. London. Ref. 298

To discuss these or our unadvertised appointments in more detail and in strictest confidence, call X. Calibur on 01-353 8201/3 or write to
47 Essex Street, London WC2R 3JF.
Computing Services Association
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X·Calibur
COMPUTER SERVICES

SOUTH MANCHESTER

TEAM EXPANSION

Our client is a leading engineering concern based in South Manchester convenient to motorway connections serving all Greater Manchester districts. The ICL installation is being developed to support on-line systems for their UK-based factories and the arrival of new hardware is imminent and has already been commissioned.

We are arranging confidential and informal discussions for our client who would like to discuss prospects with those in the following categories.

Systems & Programming Manager (1) **£6000 pa**
A minimum of 5 years experience of systems analysis preferably with formal engineering qualifications.

Senior Programmers (2) **£4900 pa**
A minimum of 4 years COBOL programming. A knowledge of PLAN will be an advantage.

Systems Programmer (1) **£4900 pa**
A minimum of eighteen months experience in the Management of ICL standard software.

Programmers (2) **£4000-£4800 pa**
A minimum of eighteen months COBOL programming.

Systems Analysts (2) **£4900 pa**
A minimum of 2 years experience in systems analysis. Knowledge of stock and production control in an engineering environment will be advantageous.

For all positions relocation expenses are available.

To register for these vacancies, please write or telephone LEE RICHFIELD LIMITED (Computer Recruitment Consultants), Bridge Buildings, Ladybridge Road, Cheadle Hulme, Cheshire, SK8 5LL — 061-486 0591 day 061-980 6879 evenings/weekends.

After-work discussions can be arranged.

Systems Programmers

The Company

We are one of West Germany's leading banking institutions with more than 2,500 employees and with clearing functions for 52 savings banks.

Our DP-Installation

Hardware: 2 x IBM 370/168 with extensive peripheral equipment (in planning 2 x 3033 in 1979)
Software: MVS · JES2 · VTAM-NCP · CICS · ADABAS

The Responsibilities

These will include:

- Design, installation and maintenance of Operating System
- Generation and maintenance of VTAM-NCP, Emulators for data communications

The Potential

- Salaries up to DM 55,000 depending on your experience
- Long-term career opportunities within a progressive organisation

Your Background

Experience in

- Teleprocessing
- Software Engineering
- Operating System
- Knowledge of German

Please apply in writing (preferably in German) to
Hessische Landesbank
- Girozentrale -
Abteilung Personalbetreuung
Postfach 3163
D-6000 Frankfurt 1

Helaba Frankfurt
Hessische Landesbank -Girozentrale-

Communicate with Racal

Project Leaders Gloucestershire

Racal-Redac, an expanding member of the world-wide Racal Electronics Group, now wishes to strengthen its software development teams by recruiting additional project leaders for the following areas:-

Circuit Analysis

An integrated system for use by engineers in electronic circuit design. Special emphasis is placed on the user interfaces with a variety of input media.

Business Systems

Development of a general business system for use by medium sized companies. Future work will involve the extension of basic system languages and the continuing extension of user applications.

Mechanical Design

A new area of work involving the specification, design and implementation of an Interactive Graphics based system. In the initial term, you will also work closely with our sales organisation in determining world-wide market requirements.

Candidates will possess team leading ability particularly in relation to scheduling of project work and motivation of staff. They will be educated to degree level; have at least 5 years programming experience, and have a working knowledge of mini-computers used under time sharing. The company is based in Tewkesbury, Gloucestershire, a small market town set close to the Malvern and Cotswold Hills mid-way between Birmingham and Bristol. Conditions of employment include 24 days annual holiday, a contributory pension scheme with free life assurance and opportunities for personal development within a challenging environment.

Please write, noting which post interests you and enclosing details of age, experience and present salary to:-

Ian Melrose, Personnel Officer,
Racal-Redac Limited,
Newtown, Tewkesbury, Glos. GL2 8HE.

RACAL

Come to New Zealand

Large system project opportunities

£6000–£7750

The continued expansion of a large banking system requires us to find additional expertise.

You will join a successful project supporting one of the largest on-line systems in the Southern Hemisphere. This is a central system linked through three regional concentrators to a nationwide terminal system, soon to reach the 500 terminal mark with more to come.

Specifically we are looking for software support personnel with experience in either or both of the following:

- System 4 software support activities embracing J, CCP, System 4 Driver and processor-slave communications.
- 7905 NAL programming and communications. Line driver experience and experience of Communications handling under COS 400 preferred.

The project is based in ICL New Zealand's Head Office in the centre of Wellington City and overlooking the harbour. Reasonable relocation expenses will be reimbursed by the Company.

If you like the idea of plenty of sun and the outdoor life, away from crowds and commuting, then write to Carole Hudson, International Division, ICL, Bridge House North, Putney, London SW6 3JX, quoting reference CW1861. Tel: 01-788 7272 ext 2047.

International Computers
think computers – think ICL

ICL

JOIN A 2950 IN REDDITCH

Our business is heavily dependent upon our ICL 1903A installed in 1971. We will replace it this year with a larger ICL 2950 system to support our planned expansion into the 1980s to include

- ★ Merchandise control through 600 POS terminals
- ★ Management information systems using on-line facilities

We need to invest in people and we welcome your experience in

SYSTEMS * PROGRAMMING * OPERATIONS

If you have enthusiasm and potential to grow with us so much the better

SYSTEMS ANALYSTS up to £6000	You should have 1-2 years' experience. It will be an advantage if you are familiar with retailing. Starting salary will depend on your experience. Contact Tony Russell or John Shakespeare (Extension 140).
PROGRAMMERS & SENIOR PROGRAMMERS up to £5500	At least 18 months' COBOL experience is needed. If you have more (at least 3 years) and the ability to supervise a small team, you will be interested in the senior job. Salaries again depend on experience. Contact Barrie Walker (extension 77).
OPERATORS up to £4500	Again, 18 months' experience, including job set-up and file control. Applicants must be prepared to work shifts. Contact Malcolm Reboiro (extension 115).
WHO ARE WE!	We are Europe's leading retailer in the Auto, Cycle and Leisure markets.
WHERE ARE WE?	The jobs are at our Head Office in Redditch, in rural Worcestershire, Birmingham and the West Midlands are all within easy reach.
WE OFFER!	★ Progressive salary scales ★ Staff discount scheme ★ Pleasant working conditions ★ Subsidised restaurant ★ Relocation assistance, or help in obtaining quality local authority housing in appropriate cases

Contact person named on Redditch (0527) 2760 or write to him at Halfords Ltd., Icknield Street, Drive, Washford Ways, Redditch, Worcs B98 0DE.

HALFORDS
A BURMAH GROUP COMPANY

MIDLAND RECRUITMENT FEATURE

Advertisers are reminded that on June 22 Computer Weekly is highlighting career opportunities in the Midlands with a recruitment feature.

To secure space in this important feature

Contact Alan Escott 021-356 4838
or John Farrar 01-261 8098
Copy deadline: 4 p.m. Friday, June 16

Sales Executives

Potential Earnings £18,000 + & Car

S.E. London/Sussex,
North West/Lancs &
Cumbria

Specialists in distributive computer systems, the DATA 100 Corporation is established amongst the 'Top 25' American computer manufacturers.

Since its formation in 1970 the Company's outstanding success has been based on equipment reliability, unrivalled customer support and dedicated sales effort.

The continuing expansion of the U.K. company and the growing demand for our products have created exceptional opportunities for additional sales executives.

Applicants must boast a successful track record in selling to the general data processing environment and a sound applications/systems knowledge.

If you wish to become part of DATA 100's exciting future and join a highly successful sales force, with average earnings well into five figures, waste no time in contacting:

Helen Mitchell,
DATA 100 Systems Ltd.,
Arden Grove, Harpenden,
Herts. AL5 4UD.
Tel. Harpenden 63161.

DATA 100

SYSTEMS DESIGNER/ PROGRAMMER

£5,000-£6,000 p.a.

THE COMPANY

BASE TEN SYSTEMS is a multi-national company, well known in the aerospace industry for their sophisticated micro-processor based systems.

The Company is already making significant sales to industry of its range of MAGUS turnkey process control systems built around G.A. & D.E.C. processors.

We are engaged in a programme to further expand this activity which will eventually require the formation of a new department. It is expected that the successful candidate will expand this new department as required.

THE JOB

The successful candidate will be responsible for

Supporting of Sales and customer liaison.
Equipment / Systems specification for both hardware and software.
The Writing of end-user software.
Commissioning systems and customer training

EXPERIENCE

Candidates will probably be aged 25 to 35 and must have had a minimum of three years' experience in process control systems and the writing of assembler Level Systems programs.

He/she will be expected to work with minimal supervision to meet customer delivery dates.

There will be a limited amount of UK and overseas travel. Company pension scheme, four weeks holiday and assistance with re-location expenses where appropriate.

Write or telephone in first instance to Mr. T. Boucher

BASE TEN SYSTEMS LTD

Unit 3, Lower Fernham Road
Aldershot
Hampshire, GU12 4HV
Tel. Aldershot 312911

Systems Analysts

Few Local Authorities can offer these opportunities in Computer Development

The London Borough of Brent wishes to appoint a Systems Analyst, with responsibility for identifying further opportunities for Computer Usage within its Department of Development, and for identifying existing problems and recommending solutions.

The successful candidate, male or female, who will hold the position of Computer Development Officer, will have full project involvement from initiation of feasibility studies, to examination of commercial packages and implementation within programming restraints.

N.B. Current installation consists of an IBM 370/145 located at Acton, with VDU and printer on direct line from Brent.

Starting salary will range between £5797 and £6382 p.a., depending on age and experience. Enthusiasm and ability to transmit ideas to a wide range of professional staff are essential qualifications.

Further details and application forms from the Administration Manager, Room 708, Brent House, High Road, Wembley, Middlesex, returnable by 15th June. Telephone 01-903 0371 (24-hour Ansafone Service). Please quote Reference number D/60/D.

London Borough of
BRENT

MICRO CONSULTANTS GROUP

SOFTWARE WITH MICRO CONSULTANTS

Micro Consultants software team is working on major high technology developments in both industry and research for application throughout the world. The areas of activity embrace data logging, control and instrumentation, video processing with interactive equipment for applications in medical, radar and television associated areas.
Continued expansion within the Group has created opportunities for posts at several levels.

SOFTWARE PROJECT LEADERS

We are looking for experienced systems programmers who have worked on technical projects using mini and/or microcomputers and who have the ability to manage a small team developing system or application software. An engineering, mathematical or scientific background would be an advantage, but is not essential.

TECHNICAL PROGRAMMERS

If you have had some experience in writing and commissioning real time programs in technical application areas we would be very interested to hear from you. Ideally you should have assembly language experience on a PDP-11, Alpha LS12 or Motorola 6800 processor, but experience on any mini or micro processor would be useful.

The Group owns a considerable number of mini and micro systems for software development work, and offers those interested the opportunity to become familiar with a wide range of special purpose digital electronic equipment.

Micro Consultants is situated in rural Berkshire occupying modern premises in Central Newbury, with excellent facilities. The Company operates a comprehensive pension scheme as well as having an active social club.
*Attractive salaries *Relocation expenses where appropriate

Write or telephone for an application form to
The Group Personnel officer
MICRO CONSULTANTS GROUP, West Mills, Newbury, Berks
Tel Newbury (0635) 48222 ext 205

Lead the Programming Revolution

Teach Infotech Programming Technology

Computer programming is in the middle of a revolution. New ideas and techniques are constantly emerging.

If you combine programming experience with teaching ability you could be helping to spread these new approaches. As a lecturer/consultant with Infotech Methods you will be using your skill and judgement to help other programmers achieve reliable, maintainable programs – every time.

You will be teaching courses in Infotech Design Technology, refining and developing new training materials, and most importantly growing with a small but ambitious company. Opportunity for worldwide travel.

Salary up to £8K for the right person.

Send career details to Mayar Wantman, quoting reference C. All replies in strict confidence.

IML Infotech Methods Limited
Nicholson House Maidenhead Berkshire SL6 1LD England, Telephone Maidenhead (0628) 31031 Telex 847319

SIEMENS

Word Processing –

A brand new future

When we make an exhibition of ourselves, you can be sure we'll have something to show for it.

The word-processing revolution is under way and gaining momentum, transforming office and commercial practise with more and more companies realising that the potential for EDP systems is not confined to accounting or production-orientated activities.

At Siemens we are currently introducing onto the UK market our sophisticated but flexible system which has already established itself in eight European countries.

This is a competitive and exciting field and we can offer exceptional openings for the following people:–

Sales Professionals
Customer Advisers
Software Support Specialists
Demonstrators

Men and women with the right background in office systems, mini computers or peripheral equipment can expect top salaries and comprehensive benefits.

If you would like to discuss your future in word processing, you will find us from the 6th to the 8th June at the International Word Processing Exhibition to be held in the Wembley Conference Centre, where the world's leading authorities in this expanding field will be swopping ideas.

But in the meantime you can contact Tony Weeks, Personnel Manager, Siemens Limited, Siemens House, Windmill Road, Sunbury-on-Thames, Middx. Tel: Sunbury 85691.

OPERATORS

Two Snr. DOS VS Power Operators

If you have eighteen months' experience and you are willing to train Junior Operators, this small banking company would like to meet you. Fringe benefits include season ticket loans, and subsidised mortgage facilities.

To £4,500

IBM DOS Operators

If you are working within an Installation which to you has become boring due to lack of advancement then its about time your experience was widened to include VS, CICS etc. Four companies in London are looking for Operators with at least 12 months' experience and training will include courses at IBM

To £4,000

INTERVIEWER/OPERATOR

If you have experience of operations then your experience could be worth a great deal both in job satisfaction and Remuneration. If you feel you now wish to enter an expanding company, which offers unlimited potential for the right person, call me now, Martin Greyson, to arrange an informal interview.

£7,000-£10,000

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A wide range of opportunities exist for operators with at least six months' experience to continue their career in this large computer service organisation, offering very good prospects for above average operators.

£3,200-£4,000

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COMPUTER RECRUITMENT **01-353 6931**
9 ST. BRIDE ST., LONDON EC4

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Hardware Specialists with software understanding
Software Specialists with hardware understanding

The company is situated 25 kilometres from Brussels and offers attractive fringe benefits allied to lower than U.K. taxes. Salaries will be in the range

£8,500 - £13,000 per annum

depending on experience.

We also need **FREELANCE PDP11 with BASIC Specialists** for 4 months at a fee of £1,500 per month.

Please write with C.V. to:
Gabor Weiner, N.V. **vector** International S.A.
Research Park, 3044 Haasrode, Belgium
or phone Phil Bowe on London (01) 878 7861
referring to **vector**

COMPUTER PROGRAMMER

LONDON EC2

R. S. COMPONENTS LTD, Britain's biggest Distributor of Electronic Components, requires an experienced computer programmer to join a small team that currently runs twin Univac 9480 equipment. Primary duties will be to assist in software maintenance/development but will also be expected to assist in day-to-day computer room activities.

Applicants must have at least 12 mths. experience in COBOL and ASSEMBLER and possess a minimum 5 'O' Levels incl. Maths and English. Those with real time as well as operating (OS4) and JCL knowledge will have preference.

SALARY £4,000 p.a. (A 10% attendance allowance is currently payable in addition to basic salary.)

Please apply to
R. S. COMPONENTS LTD.
PERSONNEL DEPT.
13/17 EPWORTH STREET
LONDON EC2P 2HA
Tel. 01-253 4073

Computers and Aircrew Scheduling

British Airways requires a Development Officer to work in the Aircrew Scheduling Projects Unit at Heathrow Airport, close to Hatton Cross tube station.

The successful applicant will join a small team whose duties include preliminary surveys of crew scheduling procedures, the production of functional specifications of new computer systems and co-ordinating the implementation of Crew systems. He or she will be engaged in the Research and Development of new techniques to permit further computer applications in the field. Candidates must be graduates, preferably holding a Science/Mathematics based degree, and have experience of developing Computer Systems. Operational Research or Statistical knowledge/experience would be an added advantage.

Salary on appointment will be a minimum of £[illegible] rising to £5255 per annum on an Incremental scale. Earnings incorporate a productivity supplement paid subject to achievement. In addition we offer excellent airline benefits including a holiday pay supplement, a first-class index-linked pension scheme, subsidised cafeteria, sports and social facilities and favourable opportunities for holiday air travel.

For an application form please 'phone 01-897 3246/[illegible] (between 9 am and 4 pm) or write to: Head of Recruitment and Selection, British Airways (Ref [illegible] TR), PO Box 10, Heathrow Airport - London, Hounslow, Middlesex TW6 2JA.

British Airways welcomes applications from suitably qualified Registered Disabled Persons.

British airways

SHAPE TECHNICAL CENTRE

The Hague, Netherlands

The Centre which is a NATO Research Establishment, has vacancies in the Command Control and Systems Division for

INFORMATION SYSTEMS ANALYST

DUTIES:

a) participate with military and civilian personnel in requirements analyses concerning information processing, transfer and display; design hardware and software solutions to these requirements
b) develop evaluation methodologies and evaluation tools for making qualitative and quantitative judgements on performance improvements, including the collection of data on the technical performance of the information systems and on how this performance affects command and control

ESSENTIAL QUALIFICATIONS AND EXPERIENCE

Applicants for both positions shall have either a university degree in electrical engineering, computer science, physics, or equivalent professional qualifications and a minimum of five years of experience in the field of information systems for command and control or management. Applicants will have participated for at least 18 months in a project to develop a management decision and information system with modern information handling and presentation facilities.
Specific qualifications for Post 1: experience in the design of man-machine interfaces specifically computer supported graphics displays as well as experience in graphical data structures.
Specific qualifications for Post 2: experience in real-time operating systems and local computer/workstations interfacing.
The contracts to be offered will be for two years only. Tax-free annual gross remuneration range from DG 79,000 to 90,000.
Applications, including details of training, experience and personal data, should be sent to the Personnel Officer, SHAPE Technical Centre, P.O. Box 174, The Hague, the Netherlands.

DATA PREPARATION

J. R. Parkington and Co. Ltd., 159-161 New Bond Street, London, W.1, a subsidiary of Period International, require an adaptable person, initially as Data Preparation Clerk for their NCR CENTURY 75 Installation. Card punching and/or VDU experience essential. Operator training will be offered to suitable applicants. Good salary and other benefits to commensurate with an International Organisation.

Telephone Gordon Andrews on 01-493 72[illegible] for an appointment

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Systems Programmer/ Operator

Scotland

Our Client—the research function of a major primary industry—requires a Systems Programmer/Operator for a PDP 1160 time sharing system using BASIC-PLUS currently being installed at its laboratories in Scotland.

The job entails the day-to-day supervision of the running of the machine and peripherals, as well as systems programming including statistical support services to both local and remote users.

The successful candidate will be part of a team aimed at improved economic success through technical support and innovation.

Relevant qualifications are a degree in Computing Science or Mathematics. 2/3 years' experience in systems programming/computer operation would be advantageous.

Please write in the first instance, enclosing details, to the address below. (Reference 760 must be quoted on your envelope. Enclose separately a note of any companies to which your application should not be sent.)

Ronald Fairbairn, Everetts Recruitment,
10 Greycoat Place, London SW1P 1SE

EVERETTS recruitment

HERTS and NORTH LONDON

ANALYSTS	**£5,000/£7,000**
PROGRAMMERS	**£4,000/£5,800**

Haymarket Computing are D.P. recruitment consultants to 35 companies in the Herts/North London area, and we are currently anxious to meet Analysts, Analyst/Programmers and Programmers on behalf of clients located in **Stanmore, Harrow, Borehamwood, Cockfosters, Enfield and Tottenham.**

Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc., so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring:

**HAYMARKET
COMPUTING LTD.
Tel. Cuffley (Herts.) 4130
up to 6.30 p.m.**

CITY TREASURER'S DEPARTMENT

PROGRAMMER

AP.3/4/5 £3,395-£4,815 p.a. (further pay award pending operative from 1st July, 1978)

The City Council is currently converting from an IBM 360/30 to an ICL 2904 computer. The new machine which is already installed has 4 EDS 60 discs and will shortly have 7502 communications equipment. The successful applicant will join a team responsible for the conversion of existing applications and development of new applications. Applicants should have had several years' experience in the use of COBOL with ICL machines.
Commencing salary within the above range depending upon qualifications and experience. Assistance with housing accommodation, payment of removal expenses, lodging and travelling allowances in approved cases.
Application forms from the Chief Personnel Officer, Town Hall, Stoke-on-Trent, ST4 1HH or telephone 0782 48241 — Extn. 481.
Closing date, 15th June, 1978.
It is a requirement of the City Council that the person appointed to the above post shall be or become a member of an appropriate, specified trade union.
S. W. TITCHENER
Town Clerk and Chief Executive Officer

City of STOKE on Trent

Systems Consultancy and Implementation

لوجيكا

Logica, the major international computer services company, is continuing to expand its activities in the Middle East. We are currently working on major projects in Iraq, Libya, Saudi Arabia and Kuwait.

Our expansion in this area involves both consulting and implementation work for a variety of clients such as banks, oil companies and government agencies, and offers challenging and rewarding opportunities for people wishing to exploit and extend their experience.

The range of application areas is wide and includes specialised systems employing on-line working and database techniques as well as financial and commercial systems, administrative DP and inventory control.

Project Managers

If you have substantial experience, over a period of at least five years, of leading and managing major implementation projects, then we would like to hear from you. You should be able to demonstrate the ability to lead a large turnkey project from initial conception and design, through development and installation to successful running. There will also be opportunities for short term consulting assignments assisting clients to formulate their computing requirements and plans prior to implementation.

Senior Consultants

We have many opportunities for suitably qualified people to undertake both short and long term consultancy assignments for Arab clients. This work will typically involve computerisation feasibility studies, system specification, equipment evaluation and detail system design. If you have a successful record of systems design and implementation in any of the above-mentioned, or related areas, and are ready to advance your career as one of Logica's consultants, either working alone or as part of a team, then give us a call.

All these posts are London-based, but involve travel to the Middle East for assignments of varying length. Logica offers an outstanding career development environment, together with good salaries and fringe benefits including Life Assurance and Pension scheme.

For further information, call Kathleen Scott on 01-637 9111 or write, quoting reference MEO/4, to

logica FREEPOST 21
London W1E 4JZ.

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TOP-CLASS SALES EXECUTIVES AND EXPERIENCED CUSTOMER ENGINEERS

Documation is a worldwide supplier of OEM Peripherals. The Company is currently expanding its End User Base in Europe.

We now seek the above personnel to develop the U.K. customer base.

Your proven experience will be well rewarded along with excellent fringe benefits.

This is an opportunity to grow with the Company and will be of interest to those with the will to succeed.

For initial interview please telephone or write to:

**Dudley Weeks or Alan Dallamore
at
Mill Mead, Staines
Middlesex TW13 4UG
Staines 61124**

North Sea Oil Exploration and Production

PROGRAMMER/ SYSTEMS ANALYST

Sunbury-on-Thames

Unionoil Company of Great Britain, a subsidiary of Union Oil Company of California, wishes to engage a Programmer/Systems Analyst for the Computer Services Department at the Sunbury-on-Thames Head Office. This is a new position in a newly established department offering a unique opportunity for professional challenge and scope. Reporting to the Manager, Computer Services, responsibilities include systems analysis, design, programming and liaison with the Accounting, Petroleum Engineering and Geological/Geophysical departments.

Candidates, male or female, should have a B.Sc. degree, three to five years' experience with FORTRAN, BASIC or COBAL and familiarity with IBM systems.

This permanent position offers a very competitive salary and benefits package and interesting career opportunities with an international oil exploration and production company.

Interested persons should respond in writing to the address below. All responses will be held in strict confidence.

*Manager, Administrative Services,
Unionoil Company of Great Britain,
32 Cadbury Road,
Sunbury-on-Thames, Middlesex.
Telephone: Sunbury-on-Thames 85600*

union 76

ملحق من الأجل

STAVELEY COMPUTING CENTRE
Blackpole Road, Worcester

PROGRAMMERS

required. Male/Female
CIRCA £5-£5.5K

Apply to Mr. M. Collett
Manager Systems and Programming
Tel: Worcester (0905) 53385

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Urgently required for trainee positions. Industrial, Scientific, Commercial Situations. Salaries c £3,000.
ALL AREAS

29 Windmill St. London, W.1.
637 5551 day: 636 9659 eve.

RPG II/BASIC

I am looking for people with 18 months' plus for varied and well-paid permanent work up to £8,000 per annum.
Meetings arranged any time, anywhere.

**01-505 5576
(24 hours)**

UNIVERSITY COLLEGE, CARDIFF
Departments of Sociology, Law and Computing Mathematics

S.S.R.C. RESEARCH STUDENTSHIPS

Applications are invited from candidates who have, or expect to obtain in July, 1978, good honours degrees in relevant subjects for research studentships in the following areas:

Sociology (3)
Sociology and Law (2)
Sociology and Computing Mathematics (1)

The studentships are tenable for two years from October 1st, 1978. Further information may be obtained from David Berry, Department of Sociology, University College, P.O. Box 78, Cardiff [illegible]

UNIVERSITY OF SALFORD
COMPUTING LABORATORY

Programmer

In the Operating Systems group of the Computing Laboratory to provide systems support and development for the University's computing service on its PRIME 400/300 and ICL 1904S configurations. Applicants should have a good knowledge of FORTRAN and any assembly language experience would be an advantage.

Salary £3,169-£4,601 USS Superannuation.

Further particulars and application forms may be obtained from the Registrar, University of Salford, M5 4WT, to whom completed applications should be returned by 1 June 1978 quoting reference CL/51/CW.

ICL System 4 Operations Staff

A brighter future for you with Dataskill!

Dataskil's continuing and significant expansion has resulted in our Operations Services Region having immediate vacancies on a salaried or contract basis for

OPERATORS - SENIOR OPERATORS
SHIFT LEADERS
OFF-LINE CONTROL STAFF
OPERATIONS SUPPORT STAFF
WITH J1800 AND 4/50 or 4/70 EXPERIENCE

You will initially become members of our expanding London-based team working on a large transition project. Familiarisation training will be provided. Dataskil expects to be involved in further large transition projects. Therefore, prospects for training and progression to 2900 during 1978 are good for people who are willing to adapt to changes in patterns and location of work

For further details about Dataskil and the remuneration package phone Andy Woodham or Peter Kenny on Reading (0734) 581258, ext 48, or Wendy Clarke on 01-242 4382, ext. 11. Alternatively, send career details to Andy at Operations Services Region, Dataskil Limited, Reading Bridge House, Reading RG1 8PN. Please quote reference CW1869.

ICL Dataskil
The Computer Professionals

Trainee Analyst/Programmers in Life Assurance

Degree/HND

We are looking for two people to train as analyst/programmers in our Data Processing Department based at Hitchin, Hertfordshire. Ideally graduates or holders of HND in Business Studies, Computer Studies, Mathematics or similar subjects would be most suitable.

In order to acquire some knowledge of our business the successful applicants will spend a short period in our Life or Pensions Departments before taking up their permanent positions.

Our data processing requirements are expanding rapidly and we are shortly converting to a 640K NCR Criterion V-8570 operating under VRX.

Current staff benefits include a generous non-contributory pension and sick pay scheme, 3½ weeks' annual leave, free luncheons and flexible hours. An effective staff house purchase scheme is available after a qualifying period of service.

If you are interested (and are prepared to reside within easy reach of Hitchin) and have the necessary qualifications please phone or write for an appointment to:—

Mr H. M. Morgan, Head of Personnel and Training,
Provident Mutual Life Assurance Association,
Administration Centre, Wedgwood Way, Stevenage, Herts SG1 4PU.
(Tel: Stevenage 4343).

PROVIDENT MUTUAL
LIFE ASSURANCE ASSOCIATION·FOUNDED 1840

LONDON BOROUGH OF LEWISHAM

TOWN CLERK & CHIEF EXECUTIVE'S DEPARTMENT

COMPUTER OPERATOR

£3,282-£3,622 plus shift allowance

A vacancy has arisen from internal promotion for the post of Computer Operator and applications are invited from suitably qualified and experienced candidates. The present installation comprises an IBM 370/135 with 3340 disks and 3410 tapes under DOS/VS and POWER/VS. Forthcoming upgrades include an IBM 370/138, 3344 disks and 3420 tapes. Continuous development is being undertaken and a wide variety of interesting applications processed. A two-shift rota is worked covering 0730 hours to 2300 hours over a 5 day week.

For informal discussion, contact Dudley Bason on 01-690 4343 Ext. 280.

Application forms, returnable by June 16th, and detailed job description from Chief Personnel Officer, Town Hall, Catford, London SE6 4RU or telephone 01-690 7666 (24 hour Ansafone service) quoting reference CE298/CW and job title.

THAMES POLYTECHNIC
Computer Centre

COMPUTER OPERATOR

Applications are invited for the post of Computer Operator from persons with at least five GCE "O" level passes or equivalent. Some knowledge of computer operations would be an advantage but training will be given to a suitable person. Commencing salary up to £3,720 per annum, inclusive (Salary award under review).

Details and application form (to be returned by 13th June, 1978) from the Staffing Officer, Thames Polytechnic, Wellington Street, London SE18 6PF (01-854 2030 Ext. 433).

WANTED
Female/Male assistant to
SENIOR ASSOCIATE
within own Business
Phone
VIP CONSULTANTS INTERNATIONAL
01-491 [illegible]

PLYMOUTH POLYTECHNIC

RESEARCH ASSISTANTS

required for the following areas of study:
School of Maritime Studies
and
School of Electrical Engineering

RADAR SIGNAL PROCESSING

To work on picture and signal processing of radar signals, in conjunction with Kelvin Hughes (Equipment & Systems) and the National Ports Council

School of Mathematical Sciences
and
School of Maritime Studies

COMPUTER SIMULATION OF MARINE TRAFFIC BEHAVIOUR IN CONFINED WATERS

To work in conjunction with the National Maritime Institute

The persons appointed will join an interdisciplinary team concerned with inshore navigation problems. Good honours degree in Maritime Studies, Engineering or a Mathematical Science. Significant experience in computing and one of the Marine Industries would be an advantage.

Research Assistants are normally required to register for a higher degree, although post-doctoral applicants will be considered. Appointments are for a period of two years, normally commencing 1st September, with a possibility of a third year (fixed term contracts). Salary will be £3,192 for post-graduates or £3,468 post-doctoral (or equivalent) with annual increments of £138.

To obtain further details and application form, write specifying the project(s) of interest to the Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth, PL4 8AA. **Closing date: Friday, 16th June, 1978.**

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METROPOLITAN BOROUGH OF TRAFFORD
BOROUGH TREASURY DEPARTMENT

Senior programmer and experienced programmer required. Applicant should be experienced in COBOL and preferably be familiar with IBM equipment. The successful candidate will control a small team working under a project leader and will be expected to undertake some systems design and systems testing.

SENIOR PROGRAMMER SOFTWARE

Applicants are invited from experienced BAL programmers that wish to become system programmers. Candidates should be able to generate a DOS/VS system and have some experience of COBOL CICS/VS and power/VS. The duties will include the maintenance of the above products, performance tuning and the upkeep of other software as well as assistance to the system and development. Starting salary for both posts AP3/4 £3,395-£4,214 (inclusive of supplements). The council operates an IBM 370/135 and a DOS/VS. A variety of financial and non-financial applications are presented currently and it is intended to expand the existing tele-programming system and introduce new data based techniques.

Application forms and further information from
Miss S. Dorson,
Borough Treasurer's Department
P.O. Box 10, Warwick House, 35-37 Washway Road, Sale.
M33 1AL
Tel: 061-962 8161, ext. 242.

Completed forms should be returned to the Borough Treasurer by 16th June, 1978.

CHIPPENHAM
BRACKNELL
WOKINGHAM
H

EACH WAY IT'S A GOOD BET.

Three great places to work, and plenty of work to get your teeth into. At Westinghouse we are at the forefront of innovative technology in the use of computers for railway systems, mining, and process controls. Our order books are growing and we need ambitious (and we mean ambitious) software staff to work on a variety of projects involving mini and micro computers, real time process control and monitoring, CAD linked support systems etc. We've got a wide range of machines: HP, NOVA, DEC, and languages: CORAL 66, RTL 2, ASSEMBLER, FORTRAN etc.

We're currently looking for

Project Leaders
Analyst/Programmers
Programmers
Senior Systems Analysts
Systems Analysts

The jobs are based in Chippenham, Bracknell and Wokingham. You make the decision where you want to work — in any place you'll find the work challenging and absorbing.

If you're really good at problem solving and want to gain more experience in a company known worldwide for its innovations in modern systems then Westinghouse's the company for you.

Write today to: P.A. Aturley, Company Personnel Officer, Westinghouse Brake and Signal Co. Ltd., FREEPOST, Chippenham, Wilts. Telephone Chippenham (0249) 4141

WESTINGHOUSE
Brake and Signal Co Ltd Chippenham Wilts

Advanced Technology in Chippenham, Wokingham & Bracknell.

ISLE OF WIGHT COUNTY COUNCIL

Treasurer's Department
Computer Section

Senior Computer Operator

Grade T2/3 — £2,983-£3,773 (includes supplements)

A vacancy exists for an operator with at least 2/3 years' experience of working with IBM 370/115 & 125 under DOS/VS and Power.

The Authority operates an IBM 370/115 — 128K, 3 x 3340, 2 x 1411, 1 x 3540, 1 x 2501, 1 x 3203.

Application forms and job descriptions can be obtained from the Personnel Officer, Isle of Wight County Council, County Hall, Newport, Isle of Wight.

Closing Date 15 June 1978

Support Officers(2)

SALARY: £3,694-£4,507 including supplements and London Weighting (A P 3/4). National Salary Award pending (July 1978)

Bexley will start in-house data processing from [illegible] 1978. The equipment will consist of a 1 megabyte IBM 370/138 using DOS/VS, POWER/VS with CICS, PLUS CODE and DL/1. An extensive VDU communications network is also planned. Data entry will be by Redifon Seecheck.

Support officers are required to set up and maintain JCL, control the libraries and provide statistical information. They will also liaise closely with the systems and programming department and be expected to answer user queries including the communications network.

Applications are invited from IBM off-line staff experienced in off-line, job control and support procedures.

Please write for an application form to D. Jarvis, Operations Manager, Data Processing Department, 9 Brampton Road, Bexleyheath, Kent.

Closing date 16th June 1978

Bexley London Borough

DatasolveDatasolveDatasolve

Remote services are going to play a big part in our future.

And maybe in yours.

You've probably heard about the machine capacity that's given Datasolve such a lead in processing power – the 370/158's configured as a multi processor, the 2970 and of course the still-rare Amdahl V5. To make the most of that power, we're turning increasingly to remote computing services – TSO, TSO3, RJE, CICS, HAC and TP(ICL).

We're now looking for a man or woman to play a big part in the marketing and development of these services.

Much of the work is analytical. You'd take a close look at the overall remote services market, and at what the competition are up to. Then you'd take a critical look at our own services, and suggest how we can improve them. But your unusually wide brief would also include sales and marketing support work such as seminars and demonstration material, and even sales and user documentation.

At present, you're probably in marketing or technical support with a bureau or a large manufacturer. You'll have at least five years' experience of creating systems in an on-line and/or TP environment, and at least a couple of years in a bureau. Your technical skills will include in-depth knowledge of at least one high level language, preferably COBOL. Whatever your present role, you'll be feeling restricted by too narrow a job definition, and you'll be looking for a role that gives you plenty of room to use your initiative.

If you are currently earning £6000 - £7000pa, we can reward you for the high degree of individual responsibility implicit in this role. But as well as money, there's the attraction of joining the company that's making the running in remote services, and in many other areas of computing as well.

If you're seriously interested, please write with brief career and personal details to Ros Baker:

BOC Datasolve

BOC Datasolve Limited,
Datasolve House, 99 Staines Road West, Sunbury-on-Thames, Middlesex.
Telephone: Sunbury 85566.

International EDP Auditor

We are seeking:—
—an EDP professional with basic accounting knowledge to join our EDP Auditing Group based in London on assignments to cover all EDP aspects of Mobil's United Kingdom and its European serviced petroleum and chemical operations.

The work involves:—
—review of Systems and Data Processing Installations, appraisal of internal controls and operating procedures of computer systems, discussion of findings and recommendations with Senior Management culminating in submission of reports which must be clear and concise. Other duties include advising non-EDP auditors on implementation of computer audit and retrieval programs. High standards of performance are expected and the ability to communicate effectively at all management levels is essential.

Candidates must be:—
—Male or female, preferably 25–35 with at least five years' experience with large scale computer equipment and mini-computers; experienced in systems analysis, programming, project management and computer operations; preferably holding University degree. Although a professional accounting qualification is not essential, some experience and/or training in accounting is necessary.

The assignment would be:—
—attractive because of occasional European travel involved and consequent tax advantages.
—most helpful in providing the incumbent with management EDP auditing experience for further career progression in EDP or financial management within the world-wide group of Mobil Companies.

We offer:—
—attractive salary package, life assurance, pension and dependents' benefit scheme.

Please write giving details of qualifications, experience, age and current salary, or telephone:—

P. J. Johnston, Mobil Oil Company Limited,
54-60 Victoria Street, London SW1E 6QB.
Telephone 01-828 9777

Mobil

COBOL PROGRAMMER

STARTING SALARY UP TO £4,800 per annum
(Including Phase III with effect from 1.7.78)
Grade 3 or 4

A vacancy has arisen for a Cobol Programmer in the Company's computer section. The successful candidate will have a minimum of 2 years' experience on ICL Computers preferably a 2903. A sound knowledge of ICL utilities is sought along with operating and RPGII experience, although the latter is not essential.

Please telephone, or if you prefer write, for an application form to
C.R.S. Lewis
The Sutton District Water Company
59 Gander Green Lane
Cheam, Sutton, Surrey
Tel: 01-643 8080

LONDON BOROUGH OF HARINGEY
COMPREHENSIVE HOUSING
SERVICE

COMPUTER OFFICER

£5,044-£5,[illegible] plus casual user car allowance SO1

Haringey's Comprehensive Housing Service is looking for a person who has computer systems development experience and who would now like to put this experience to use in an effort to improve the operating efficiency and information systems of the Housing Service for the benefit of the public.

An enthusiastic, self motivated person is therefore required who can ensure that new or existing computer based systems are fully developed and utilised.

This is a new post which is based within the Housing Service to ensure that benefits derived are service orientated. The post holder will also be required to liaise closely with an existing Borough development team whose main role is to develop the use of a joint consortium, on line, computer network L O L A which uses an I B M 370/158. The successful applicant could work on any Housing Service function which requires computer system support (e.g. property records, rents, waiting lists etc.), and should have the ability to liaise closely with other officers to understand and identify areas where computer developments are needed.

Application form and job description from
Chief Administrative Officer, 13/27 Station Road, Wood Green, N.22.
Applications returnable by 21st June, 1978

UNIVERSITY OF LONDON
ROYAL FREE HOSPITAL SCHOOL OF MEDICINE

PROGRAMMER

To join Regional Heart Study team (MRC grant) doing large-scale surveys throughout Britain into the causation of heart disease.

The appointment involves a wide variety of computing applications using the London University CDC, use of a computer registration system for 7000 men, processing of survey data, computer interpretation of ECG, statistical programming, organisation of computing facilities and programming advice.

Relevant experience essential. Appointment initially for two years. Salary scale £3664-£6061 including London Weighting.

Applications, with two referees, by June 16 to Professor A. G. Shaper, Dept. of Clinical Epidemiology, Royal Free Hospital, 21 Pond Street, London NW3 2PN. Tel. 01-794 0431 ext. [illegible] for details.

MEDICAL COMPUTING & STATISTICS UNIT

COMPUTING OFFICER/PROGRAMMER

Required by the MEDICAL COMPUTING AND STATISTICS UNIT for a medical research project into the early detection of breast abnormalities. The appointee will assist with the computer processing of the project records, working in close contact with doctors and statisticians. A high degree of personal involvement in the whole study will be expected. A degree, or equivalent qualification or training, in either data processing, programming or statistics and familiarity with medical records would be an advantage. Programming experience, especially file handling, is essential. The post is grant-supported until 30th September, 1981. Salary on scale £3060-£6176 but the appointment will be at the lower end of the scale. Closing date for applications 23rd May, 1978. Further particulars and application forms are available from:

W. Lutz
Medical Computing & Statistics Unit
Edinburgh University, Edinburgh.

Please quote reference 7012

Last week the Hexadecimal Kid set out optimistically on his new adventures to beat the system, this week however, he has had to go back into storage because of pressure on space. We apologise for this delay in his journey but will get him back on the road as soon as possible.

Puzzler

IF E is 1, as seems likely, then T = 9 is very probable. Filling in these two figures gives a fair start, and the rest is not too difficult. The solution is: 9,713 + 9,169 + 12,479 + 92,516 + 913 = 124,790.

SENIOR PAYROLL ANALYST

The Company Financial Systems Department based at the Brough, North Humberside, factory of British Aerospace is responsible for the development and support of Payroll Systems covering Hourly, Weekly and Monthly paid employees.

The payrolls are run locally at several of the factories within the Aircraft Group of British Aerospace, utilising I.C.L. 1900 equipment.

Plans are now being established to review the systems in the light of operational experience, the availability of on-line and data base facilities, the need to provide for future changes and a move towards I.C.L. 2900 computers. The object is to produce a stable system capable of satisfying user requirements well into the 1980's.

A vacancy exists for an experienced Systems Analyst to join a small Project Team specialising in the Payrolls and Personnel aspects of a set of Integrated Financial Accounting and Control Systems.

The successful applicant will make a major contribution to the provision of an effective and continuous service to users at several locations in the U.K. and in the planned re-development of the systems.

Applicants should have two or more years experience and previous knowledge of Payroll Systems would be desirable though not essential for a person with the right motivation.

- A competitive salary is offered commensurate with the ability and experience of the successful applicant.
- The Brough factory is situated in attractive countryside eight miles west of Hull. The area offers reasonably priced housing.
- Assistance with relocation expenses can be provided.

Please contact:—

Mr. N. M. Brolls,
Head of Personnel,
Brough, North Humberside.
Tel: 0482-667121

BRITISH AEROSPACE
AIRCRAFT GROUP
KINGSTON·BROUGH DIVISION

MIDLAND RECRUITMENT FEATURE

Advertisers are reminded that on **June 22** Computer Weekly is highlighting career opportunities in the Midlands with a recruitment feature.

To secure space in this important feature:

Contact Alan Escott 021-356 4838 or John Farrar 01-261 8098

Copy deadline, 4 p.m., Friday, June 16

Malmesbury, Wiltshire

Career Opportunities with Pye TMC Limited

Microprocessors Software Computer Aided Design

(Up to £7,000)

The Company's Advanced Development Division is a forward looking design group, exploiting L.S.I. technology in the application of stored programmed control to telephone switching and also the development of other advanced products for the telecommunications industry in both the Switching and Subs-Apparatus areas. The Division is situated at the Company's modern new headquarters in Malmesbury, Wiltshire.

SENIOR SOFTWARE ENGINEERS

Required to work in close collaboration with L.S.I. circuit design engineers to produce new micro-processor based products. Applications are invited from Analysts/Programmers, preferably with Intel 8080/85 and mini-computer experience gained in the electronics industry. A degree in a relevant discipline is preferred but evidence of the completion of real time systems properly documented using Coral or Assembler language together with at least 5 years experience in this field is more important (Ref. ADD/WT).

SCIENTIFIC PROGRAMMERS

Required to work on the development of software tools for CAD, design automation, automatic testing and advanced graphics systems as applicable to the realisation of L.S.I. circuit design. Successful applicants will be working on computer types SEL 32 and DEC 2050. Vacancies exist at both Intermediate and Senior levels. Applications are invited from self motivated and creative people with experience of both Electronics design and Fortran programming. The successful applicant will have a degree in Electronics or Computer Science (Ref. ADD/RB).

These positions are open to suitably qualified men and women. The Company which is part of the multi-national Philips Group, offers the full range of benefits including subsidised canteen facilities; and discounts on group consumer products, etc. Generous relocation expenses will be paid where appropriate.

For further information 'phone the Personnel Department on Malmesbury 2121 or write with full details of education and career to date (quoting the appropriate reference) to the Recruitment Officer, Pye TMC Limited, Swindon Road, Malmesbury, Wiltshire. SN16 9NA.

PYE TMC

[illegible]